



CITY OF ATLANTA

SUITE 1900

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ATLANTA, GA 30303

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Kasim Reed
Mayor

DEPARTMENT OF PROCUREMENT
Adam L. Smith, Esq., CPPO, CPPB, CPPM, CPP
Chief Procurement Officer
asmith@atlantaga.gov

November 03, 2014

INTERESTED BIDDERS:

Re: FC-7757, Airfield Repairs 2015

Attached is one (1) copy of **Addendum No. 1**, which is hereby made a part of the above-referenced project.

For additional information, please contact the following personnel for the respective solicitation: for FC-7467, Mr. Sherif Yassin, Contracting Officer, at (404) 330-6698, or via email at syassin@atlantaga.gov.

Sincerely,

A handwritten signature in black ink that reads "Adam L. Smith".

Adam L. Smith

ALS: ssy

Addendum No. 1

Re: FC-7757, Airfield Repairs 2015

November 03, 2014

Page 2

This Addendum forms a part of the Invitation to Bid and modifies the original solicitation package as follows:

- **Questions and Answers;**
- **Revision to Minimum Qualifications;**
- **Revision to Exhibit C, Form A-1 Schedule of Unit & Lump Sum Prices;**
- **Revision to Exhibit D, Owner's Controlled Insurance Program (OCIP);**
- **Revision to Exhibit E, Technical Specification; and**
- **Revision to Exhibit F, Index of Drawings.**

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Bids are due **Wednesday, November 12, 2014**, and should be time stamped no later than **2:00 p.m. EST** on this day, and delivered to the address below:

Adam L. Smith, Esq., CPPO, CPPB, CPPM, CPP
Chief Procurement Officer
Department of Procurement
55 Trinity Avenue, S.W.
City Hall South, Suite 1900
Atlanta, Georgia 30303

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*****All other information remains unchanged*****

Addendum No. 1

Re: FC-7757, Airfield Repairs 2015

November 03, 2014

Page 3

Acknowledgement of Addendum No. 1

Bidders must sign below and return this form with its Bid to the Department of Procurement, 55 Trinity Avenue, City Hall South, Suite 1900, Atlanta, Georgia 30303 as acknowledgement of receipt of this addendum on this _____ day of _____, 2014.

Legal Company Name of Respondent

Signature of Authorized Representative

Title

Date

Attachments

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

The following questions and/or clarifications were requested by various Contractors:

1. Question: Does a company have to be pre-qualified to perform only the spall repair work on the project? Our company has completed concrete repairs in the state and has the capacity to produce the mix required for this work on site.

Answer: Only Portland Cement Concrete Paving Contractors that are pre-qualified by the City and listed in the "Information and Instruction to Bidders" may perform spall repairs.

2. Question: If qualification is required, is it possible to get qualified prior to the letting in order to price the work?

Answer No. Please monitor the City's website for future projects at www.atlantaga.gov.

3. Question We are a national airport pavement rehabilitation contractor and may have an interest bidding your project FC-7757. Before I arrange for travel from Michigan to the pre-bid meeting next week, I would like to ensure that it is an appropriate project for us to bid. To that end it would be very helpful if you could send me a list of major quantities.

Answer: Quantities are provided under Exhibit C Form A-1 Schedule of Unit & Lump Sum Prices. Please see revisions to Form A-1 attached to this Addendum.

4. Question: The quantities for spall repair and conduit trench repair (P-505-1 and P-505-2) have increased drastically from previous airfield repair projects. However, the time to achieve substantial completion per SC-02.2 milestone 1 has decreased which does not seem realistic. Are there any plans to increase the time of performance?

Answer: Contractor shall have 210 days from contract NTP to complete work. Please see Revisions to Exhibit "B" Special Conditions.

5. Question: Would it be acceptable to provide a performance based mix for spall repair and trench repair (P-505)? It appears the specifications are sole sourcing to particular vendors for some components of the work to be performed.

Answer: Please adhere to the specification requirements.

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

6. Question: Our office has noticed a change in specification No. P-505 to include the joint sealant within the same price of the spall and trench repairs. Please verify this change as there will be additional closures required after the spalls are complete (requiring additional mobilizations).

Answer: For many years the drawing details have required joint sealant at spall repairs. The change was made to P-505 to reiterate these plan requirements.

7. Question: What are the exact location of the existing spall repairs to be performed? Which ones are critical?

Answer: Exact locations of distresses will be supplied following NTP and prior to start of construction.

8. Question: When is the anticipated NTP date?

Answer: March – April 2015.

9. Question: Is the bidder required to possess a GA utility contractor's license as well as a GA general contractor's license or was this requirement included in error? Can you please explain why this is a requirement to bid on this project?

Answer: Bidder is required to possess a valid Georgia Utility Contractor's License and a valid Georgia Contractor's License.

10. Question: Are the essential subcontractors required to hold any special licensed or hold a GA contractor's license?

Answer: No special license is required for essential subcontractors however essential subcontractors must meet the experience qualifications as listed in the technical specifications.

11. Question: If the bidder uses a PCCP from the approved list must they also submit a Form B for them?

Answer: Completion of Form B is not required for the pre-qualified Portland Cement Concrete Paving Contractors.

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

12. Question Why do bidders need to provide an OSHA Recordable Incident Rate and OSHA Lost Days Away incident rate for 2009? Why not for the previous calendar year? (2013)
- Answer To get an accurate assessment of a bidder's past safety performance record, qualify their EMR, analyze their frequency and severity rate, five (5) years of OSHA 300A are requested to allow the CITY ample data to analyze to assess risk levels of a prospective bidder based on industry codes.***
13. Question For the Safety Health and History form, should bidders provide EMRs for 2011, 2012, and 2013 OR 2012, 2013, and 2014?
- Answer Bidders should provide EMRs for the previous three years where they have been assigned an experience modification rate. In many cases, some bidders may not have their mod rate for 2014 so they will use 2011-13, whereas if they have been issued a mod rate for 2014 then they would include 2012-14.***
14. Question We are unfamiliar with an OSHA 200 log that is referenced in the Safety and Health History Form – is this requirement referring to an OSHA 300 log? please clarify.
- Answer The old 200 log is part of the old recordkeeping rule under Title 29 CFR 1904. In 2002, the 300 log replaced the old 200 log under the new OSHA recordkeeping rule. Please see revised Safety and Health History Form attached to this Addendum.***
15. Question On page 4 of 37 of the Information and Instructions to Bidders, Section 5.3 "The following forms Part 2 of this ITB:" 5.3.1 "Exhibit "D" OCIP Program Insurance Information Form (Pages 1 and 2)". These pages are part of the Required Bid Submittal –Item 22. Where are these forms located, we cannot find them?
- Answer "Exhibit "D" OCIP Program Insurance Information Form is required and provided with this addendum.***
16. Question It was stated at the Pre-Bid meeting that a Minority JV partner would be required, please confirm.
- Answer Yes, a joint venture partner is required for this contract. As stated in the Pre-bid conference this contracting opportunity scope is***

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

over the minimum threshold amount, therefore a Joint Venture is required. A Joint Venture team must be composed of two or more firms of different race or gender, and the MBE/FBE must be certified with the City of Atlanta Mayor's Office of Contract Compliance. For instructions on how to create a Joint Venture, please refer to page 6 of Appendix A in the solicitation document.

17. Question Per SC-13 Wage Requirements, "Contractor shall pay the prevailing wages as stipulated by the wage scales, which is incorporated in the Contract Documents (Section Titled WAGE AND BENEFITS Rates). Where in the contract documents can we find the reference wage scales? If not currently in the documents, please provide.

Answer SC-13 Wage Requirements, does not apply to this contract. Please see Revisions to Exhibit "B" Special Conditions.

18. Question It was stated at the Pre-bid meeting that the contract time for substantial completion would be changed from 150 to 210 calendar days, please confirm.

Answer Contractor will have 210 days from contract NTP to complete work. Please see Revisions to Exhibit "B" Special Conditions.

19. Question Does the City have an anticipated NTP date for this project?

Answer March – April 2015.

20. Question Regarding the SP-14 Rapid Response Repair Allowance Work (Form A-1):
- Are the unit prices for the Rapid Response Repair Allowance work the same unit prices as the Form A-1 Schedule of Units & Lump Sum Prices?
 - Can the Contractor adjust these unit prices for unknowns in the scope and quantities of proposed work?
 - Does the City have an approximate quantity for the various items for the additional work?
 - How will the Contractor be paid for items outside of the scope of the unit prices listed? Since SP-4-1-Traffic Control is a Lump Sum item bid item for the base bid scope of work (NTP to Substantial Completion), how will this be paid for the Rapid Response Repair Work? Same for SP-10-1- Aircraft Movement Area (AMA) Escorting, which is a Lump Sum item for the base

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

scope of work, how will this be paid under Rapid Response Work?

- e. Will this work all be required to be completed under a 24/7 schedule?

Will the contractor be required to maintain an office onsite for the extended period (Substantial completion – initial completion)? If required, how will the Contractor be paid for office, utilities, etc.?

- Answer**
- a. A secondary Form A-1 is provided in the ITB for the bidder to provide separate unit pricing for work requested following Substantial Completion. Please see revisions to Form A-1 attached to this Addendum.*
- b. Any unforeseen conditions discovered during the course of construction will be paid utilizing the Contingency Allowance. Quantities will be paid on a per unit basis at the price provided on the Form A-1. Please see revisions to Form A-1 attached to this Addendum.*
- c. Quantities will be identified on a case by case basis as repairs are needed. Anticipated quantities will be limited.*
- d. All indirect costs should be assigned to the Mobilization per Response cost. Updated Form A-1 will reflect Mobilization broken down by (1) Spall Repairs, (2) Slab Replacement, and (3) Trench Drain Repairs. Bidder is to include all associated costs under mobilization that are needed in order to complete the work per the specifications. Please see revisions to Form A-1 attached to this Addendum.*
- e. Spall repairs and joint sealing will only be permitted under night closures 11:30PM – 6:30AM. Estimated durations for concrete slab replacements and trench drain repairs will be approximately four days per location to be completed over a 24/7 extended closure.*
- f. Contractor will not be required to maintain an onsite office following Substantial Completion.*

21. Question On drawings G. 4.3, G. 4.4, G. 4.5, G. 4.6: note 1 states that the work will be completed under nightly closures; then in note 5 or 6 states that the work is to 24 hrs a day, 7 day a week. Please clarify that the work is to be completed under the 24 hr/day, 7 day per week schedule as discussed at the pre-bid meeting?

- Answer** *The night-time closures referenced in note 1 are to be used by the contractor for initial saw-cutting. Once an area is closed for construction, work must continue 24-hours a day until completion. The number of days allowed for construction is given in note 1.*

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

22. Question In the airfield repairs project document it mentions the approved list of concrete contractors. How can we get on that list? Is it coming up soon to prequalify?

Answer Please monitor the City's website for future projects at www.atlantaga.gov.

THE FOLLOWING ARE CHANGES AND/OR MODIFICATIONS TO THE BID DOCUMENTS

1. REVISION TO PART 1; INFORMATION AND INSTRUCTIONS TO BIDDERS – 3. MINIMUM QUALIFICATIONS

Delete: 3.3. The Prime Contractor will use Form "I", Experience Statement to document work experience. All Sub-Contractor work experience is to be documented using Form "B", Essential Subcontractor Qualification Statement. The essential activities/trades for this project are identified in Special Condition (SC)-09 and are comprised of the following:

- Concrete Paving
- Joint Seal
- Electrical
- Striping

As identified in SC-09, Form "B", "Essential Subcontractors", shall be completed to include all essential subcontractors and submitted with bid.

Replace with: ***3.3. The Prime Contractor will use Form "I", Experience Statement to document work experience. All Sub-Contractor work experience is to be documented using Form "B", Essential Subcontractor Qualification Statement. The essential activities/trades for this project are identified in Special Condition (SC)-09 and are comprised of the following:***

- ***Concrete Paving (Form B exempt)***
- ***Joint Seal***
- ***Electrical***
- ***Striping***
- ***AMA Escorting***

As identified in SC-09, Form "B", "Essential Subcontractors", shall be completed to include all essential subcontractors, with the exception of Concrete Paving and submitted with bid.

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

Add: *3.8 A Joint Venture is required for this ITB.*

2. REVISION TO EXHIBIT "B" SPECIAL CONDITIONS

Delete: "Exhibit "B" Special Conditions – 2.2 Intermediate Milestones No. 1,
"CONTRACTOR shall achieve Substantial Completion on or before One
Hundred and Fifty (150) Calendar Days from Notice to Proceed."

Replace with: *"Exhibit "B" Special Conditions -2.2 Intermediate Milestones No. 1,
"CONTRACTOR shall achieve Substantial Completion on or before Two
Hundred and Ten (210) Calendar Days from Notice to Proceed."*

Delete: "Exhibit "B" Special Conditions – 3.1 Estimated Liquidated Damages No.
1, "CONTRACTOR shall achieve Substantial Completion on or before One
Hundred and Fifty (150) Calendar Days from Notice to Proceed."

Replace with: *"Exhibit "B" Special Conditions - 3.1 Estimated Liquidated Damages No.
1, "CONTRACTOR shall achieve Substantial Completion on or before Two
Hundred and Ten (210) Calendar Days from Notice to Proceed."*

Delete: "Exhibit "B" Special Conditions – SC-09 Essential Subcontractors 9.1,
"Concrete Paving."

Replace with: *"Exhibit "B" Special Conditions – SC-09 Essential Subcontractors 9.1,
"Concrete Paving (Form B Exempt)."*

Delete: **Exhibit "B" Special Conditions - SC-13 WAGE REQUIREMENTS**

*CONTRACTOR shall pay the prevailing wages as stipulated by the wage
scale(s), which is incorporated in the Contract Documents (Section titled
"WAGE AND BENEFITS RATES"). Such scale of wages to be paid shall be posted
by the CONTRACTOR in a prominent and easily accessible place at the site of
the work.*

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

Replace with: "Exhibit "B" Special Conditions – SC-13 Wage Requirements [Not Applicable to this ITB]

Add: "AMA Escorting" to the list of Scope of Subcontracted Services

3. REVISION TO EXHIBIT "C" QUANTITIES, PRICING AND DATA

Delete: "Exhibit "C" Quantities, Pricing and Data Forms – Form A-1 –Schedule of Unit & Lump Sum Prices," in its entirety.

Replace with: "Exhibit "C" Quantities, Pricing and Data Forms – Form A-1 – Schedule of Unit & Lump Sum Prices", attached to this Addendum No. 1

Delete: "Exhibit "C" Quantities, Pricing and Data Forms – Form A-1 –Unit Pricing for SP-14 Rapid Response Repair Allowance," in its entirety.

Replace with: "Exhibit "C" Quantities, Pricing and Data Forms – Form A-1 – Unit Pricing for SP-14 Rapid Response Repairs Allowance", attached to this Addendum No. 1

Delete: "Exhibit "C" Quantities, Pricing and Data Forms – Form E –Safety Program," in its entirety.

Replace with: "Exhibit "C" Quantities, Pricing and Data Forms – Form E – Safety Program", attached to this Addendum No. 1

4. REVISION TO EXHIBIT "D" INSURANCE PROGRAM FORMS (OCIP)

Add: "Exhibit "D" Insurance Program Form (Page 1 & 2)," attached to this addendum No. 1

MODIFICATIONS ARE INDICATED IN BOLD ITALIC FACE TYPE
PROJECT NUMBER FC-7757 – AIRFIELD REPAIRS 2015

ADDENDUM No. 1

REVISION TO EXHIBIT “E” SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

Delete: Section SP-14 - “Rapid Response Repair Allowance”, in its entirety.

Replace With: **Section SP-14 -“Rapid Response Repair Allowance”, attached to this addendum No. 1.**

Delete: Section P-501 - “Portland Cement Concrete Pavement”, in its entirety.

Replace With: **Section P-501 -“Portland Cement Concrete Pavement”, attached to this addendum No. 1.**

Delete: Section P-621 - “Pavement Markings”, in its entirety.

Replace With: **Section P-621 -“Pavement markings”, attached to this addendum No. 1.**

Delete: Section D-705 - “Pipe for Underdrains”, in its entirety.

Replace With: **Section D-705 -“Pipe for Underdrains”, attached to this addendum No. 1.**

Delete: Section F-162 - “Chain Link Fences”, in its entirety.

Replace With: **Section F-162 -“Chain Link Fences”, attached to this addendum No. 1.**

Additions: “P-401-1 – Bituminous Surface Course”, attached to this Addendum No. 1

“P-602-1 – Bituminous Prime Coat”, attached to this Addendum No. 1

“T-904-1 – Sodding”, attached to this Addendum No. 1

REVISION TO EXHIBIT “F” INDEX OF DRAWINGS

Please see attached drawings to this Addendum No. 1.

**CITY OF ATLANTA
DEPARTMENT OF AVIATION
HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT**

FC-7757

AIRFIELD REPAIRS 2015

**FORM A-1
SCHEDULE OF UNIT & LUMP SUM PRICES**

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
SP-1-1	LUMP SUM	L.S., MOBILIZATION, AT				

		PER LUMP SUM				
SP-2-1	ALLOWANCE	AS REQUIRED, PROJECT CONTINGENCY, AT				
		<u>Four hundred thousand dollars and zero</u>			400,000	00
		<u>cents</u>				
		PER ALLOWANCE				
SP-3-1	1	PERIOD, SUSPENSION TIME, AT				

		PER PERIOD				
SP-3-2	500	MINUTE, STANDBY TIME, AT				

		PER MINUTE				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
SP-3-3	2	PERIOD, DOWN-TIME, AT _____ _____ PER PERIOD				
SP-4-1	LUMP SUM	L.S., TRAFFIC CONTROL _____ _____ PER LUMP SUM				
SP-5-1	LUMP SUM	L.S., UTILITY COORDINATION AND SCHEDULING _____ _____ PER LUMP SUM				
SP-9-1	LUMP SUM	L.S., AS-BUILTS _____ _____ PER LUMP SUM				
SP-10-1	LUMP SUM	L.S., AIRCRAFT MOVEMENT AREA (AMA) ESCORTING _____ _____ PER LUMP SUM				
SP-12-1	ALLOWANCE	AS REQUIRED, TAXIWAY LIMA VOID AND PIPE REPAIR <u>Sixty thousand dollars and zero cents</u> _____ PER ALLOWANCE			60,000	00

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
SP-12-2	ALLOWANCE	AS REQUIRED, TAXILANE DIXIE VOID AND PIPE REPAIR <u>Sixty thousand dollars and zero cents</u> _____ PER ALLOWANCE			60,000	00
SP-12-3	ALLOWANCE	AS REQUIRED, TAXIWAY SG SLOPE PAVING REPAIR <u>Sixty thousand dollars and zero cents</u> _____ PER ALLOWANCE			60,000	00
SP-13-1	LUMP SUM	L.S., STAGING AREA PREPARATION _____ _____ PER LUMP SUM				
SP-14-1	ALLOWANCE	AS REQUIRED, RAPID RESPONSE REPAIR <u>Three hundred thousand dollars and zero cents</u> _____ PER ALLOWANCE			300,000	00
P-150-1	5,900	S.Y., REMOVAL OF PAVEMENTS _____ _____ PER SQUARE YARD				
P-150-2	1	EACH, REMOVAL OF EXISTING SIGN FOUNDATION _____ _____ PER EACH				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
P-150-3	500	S.Y., REMOVAL OF EXISTING SLOPE PAVING _____ _____ PER SQUARE YARD				
P-152-1	4,400	S.Y., PREPARATION OF SUBGRADE _____ _____ PER SQUARE YARD				
P-152-2	8,000	S.Y., SELECTIVE GRADING _____ _____ PER SQUARE YARD				
P-152-3	825	C.Y., BACKFILL _____ _____ PER CUBIC YARD				
P-209-1	1,005	C.Y., CRUSHED AGGREGATE BASE _____ _____ PER CUBIC YARD				
P-401-1	150	TON, BITUMINOUS SURFACE COURSE _____ _____ PER TON				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
P-432-1	26,500	S.Y., MILL ASPHALTIC CONCRETE, 1/8" DEPTH PER SQUARE YARD				
P-501-1	420	C.Y., LOW SLUMP, LOW STRENGTH FILL CONCRETE PER CUBIC YARD				
P-504-1	1,470	S.Y., HIGH EARLY STRENGTH CEMENT NON-REINFORCED CONCRETE PAVEMENT, 20" THICK PER SQUARE YARD				
P-504-2	330	S.Y., HIGH EARLY STRENGTH CEMENT REINFORCED CONCRETE PAVEMENT, 20" THICK PER SQUARE YARD				
P-504-3	2,500	S.Y., HIGH EARLY STRENGTH CEMENT NON-REINFORCED CONCRETE PAVEMENT, 10" THICK PER SQUARE YARD				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
P-504-4	1,050	S.Y., HIGH EARLY STRENGTH CEMENT REINFORCED CONCRETE PAVEMENT, 10" THICK _____ _____ PER SQUARE YARD				
P-504-5	350	S.Y., HIGH EARLY STRENGTH CEMENT NON-REINFORCED CONCRETE PAVEMENT, 22" THICK _____ _____ PER SQUARE YARD				
P-505-1	4,000	S.F., CONCRETE PAVEMENT SPALL REPAIR _____ _____ PER SQUARE FOOT				
P-505-2	1,200	S.F., RETROFIT CONDUIT TRENCH REPAIR _____ _____ PER SQUARE FOOT				
P-602-1	330	GAL., BITUMINOUS PRIME COAT _____ _____ PER GALLON				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
P-605-1	13,285	L.F., COLD APPLIED SEALANT, CONTRACTION, CONSTRUCTION, AND LONGITUDINAL JOINTS PER LINEAR FOOT				
P-605-2	600	L.F., COLD APPLIED SEALANT, EXPANSION JOINTS PER LINEAR FOOT				
P-605-3	1,750	L.F., CRACK SEALING PER LINEAR FOOT				
P-605-4	15,635	L.F., SAW CUTTING FOR SEALING PER LINEAR FOOT				
P-605-5	190	L.F., COLD APPLIED SEALANT, ASPHALT-CONCRETE JOINT INTERFACE PER LINEAR FOOT				
P-615-1	500	S.Y., CONCRETE SLOPE PAVING PER SQUARE YARD				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
P-621-1	7,410	S.F., PAVEMENT STRIPING AND MARKING PER SQUARE FOOT				
P-621-2	6,420	S.F., PAVEMENT STRIPING AND MARKING REMOVAL PER SQUARE FOOT				
P-621-3	7,850	S.F., TEMPORARY PAVEMENT STRIPING AND MARKING REMOVAL PER SQUARE FOOT				
P-629-1	2,700	GAL., COAL TAR SEALER/ REJUVENATOR PER GALLON				
P-630-1	3,300	GAL., THERMOPLASTIC COAL TAR EMULSION SEALCOAT PER GALLON				
D-705-1	200	L.F., 8" PERFORATED PVC PIPE PER LINEAR FOOT				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
D-705-2	1,690	L.F., 6" PERFORATED PVC PIPE PER LINEAR FOOT				
D-705-3	107	C.Y., COARSE AGGREGATE BACKFILL, #89 STONE PER CUBIC YARD				
D-705-4	10	EA., UNDERDRAIN CLEANOUT PER EACH				
D-705-5	35	L.F., 8" NON-PERFORATED UNDERDRAIN OUTLET PIPE, CONCRETE ENCASED PER LINEAR FOOT				
D-751-1	180	L.F., REPAIR EXISTING TRENCH DRAIN, SINGLE SIDE PER LINEAR FOOT				
D-751-2	70	L.F., REPAIR EXISTING TRENCH DRAIN, TWO SIDES PER LINEAR FOOT				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
D-751-3	9	C.Y., MISCELLANEOUS CONCRETE PER CUBIC YARD				
D-751-4	6	EA., ADJUST STRUCTURE TO GRADE PER EACH				
D-751-5	1	EA., SIGN FOUNDATION PER EACH				
F-162-1	160	L.F., 8' BLACK PVC COATED FENCE WITH EXT. ARMS & 3 STRANDS BARBED WIRE CORED INTO CONCRETE PER LINEAR FOOT				
F-162-2	160	L.F., REMOVAL OF CHAIN LINK FENCE PER LINEAR FOOT				
F-162-3	1	EA., 14' WIDE, 8' TALL BLACK PVC COATED SWING GATE PER EACH				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
F-162-4	170	L.F., 8' BLACK PVC COATED CHAINK LINK FENCE WITH EXT. ARMS & 3 STRANDS BARBED WIRE PER LINEAR FOOT				
T-901-1	6,900	S.Y., SEEDING PER SQUARE YARD				
T-901-2	6,900	S.Y., TEMPORARY SEEDING PER SQUARE YARD				
T-901-3	60	HR., WATERING FOR GRASSING PER HOUR				
T-904-1	1,100	S.Y., SODDING PER SQUARE YARD				
T-908-1	6,900	S.Y., ASPHALT SPRAY MULCHING PER SQUARE YARD				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
L-108-1	800	L.F., SINGLE CONDUCTOR CABLE IN DUCT, #8 AWG, FAA L-824, TYPE C, 5000V _____ _____ PER LINEAR FOOT				
L-108-2	20	EA., CONNECTOR KIT, #8 AWG, 5000V, FAA L-823 _____ _____ PER EACH				
L-108-3	400	L.F., BARE COPPER CABLE, #6 AWG, COUNTERPOISE, INCLUDING GROUND RODS AND EXOTHERMIC WELDS _____ _____ PER LINEAR FOOT				
L-108-4	11	EA., 5/8" X 10' COPPER CLAD STEEL GROUND ROD, FOR LIGHT BASE GROUND _____ _____ PER EACH				
L-108-5	30	EA., CABLE TAG _____ _____ PER EACH				
L-110-1	250	L.F., CONCRETE ENCASED, 2" SCH 80 PVC CONDUIT INSTALLED IN CONCRETE PAVEMENT _____ _____ PER LINEAR FOOT				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
L-120-1	4	EA., L-852D BI-DIRECTIONAL TAXIWAY CENTERLINE LIGHT, NARROW BEAM, LED, G/G, 12" DIA., 24" DEPTH _____ _____ PER EACH				
L-120-2	5	EA., 12" DIA., 24" DEEP BASE CAN, INSTALLED IN NEW PCC _____ _____ PER EACH				
L-120-3	6	EA., 12" DIA., 24" DEEP BASE CAN WITH 3/4" BLANK COVER , INSTALLED IN NEW PCC _____ _____ PER EACH				
L-120-4	1	EA., L-852D BI-DIRECTIONAL TAXIWAY CENTERLINE LIGHT, WIDE BEAM, LED, G/G, 12" DIA., 24" DEPTH _____ _____ PER EACH				
L-124-1	800	L.F., REMOVAL OF EXISTING CABLE _____ _____ PER LINEAR FOOT				

ITEM NO.	PRELIMINARY CONSTRUCTION QUANTITY	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
L-124-2	5	EA., REMOVAL OF EXISTING FIXTURES _____ _____ PER EACH				
		TOTAL BASE BID _____ _____ _____				
	LUMP SUM	<u>ADDITIVE ALTERNATE #1</u> CONTRACTOR'S INSURANCE COST, AT _____ _____ PER LUMP SUM				

**CITY OF ATLANTA
DEPARTMENT OF AVIATION
HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT**

FC-7757

AIRFIELD REPAIRS 2015

**FORM A-1 UNIT PRICING FOR
SP-14 RAPID RESPONSE REPAIR ALLOWANCE**

ITEM NO.	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES	
		DOLLARS	CENTS
SP-1-1A	L.S., MOBILIZATION PER RESPONSE FOR CONCRETE PAVEMENT REPLACEMENT, AT PER LUMP SUM		
SP-1-2A	L.S., MOBILIZATION PER RESPONSE FOR SPALL AND CONDUIT TRENCH REPAIRS, AT PER LUMP SUM		
SP-1-3A	L.S., MOBILIZATION PER RESPONSE FOR TRENCH DRAIN REPAIRS, AT PER LUMP SUM		
P-504-5A	S.Y., HIGH EARLY STRENGTH CEMENT NON-REINFORCED CONCRETE PAVEMENT, 22" THICK PER SQUARE YARD		

ITEM NO.	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES	
		DOLLARS	CENTS
P-504-6A	S.Y., HIGH EARLY STRENGTH CEMENT REINFORCED CONCRETE PAVEMENT, 22" THICK _____ _____ PER SQUARE YARD		
P-505-1A	S.F., CONCRETE PAVEMENT SPALL REPAIR _____ _____ PER SQUARE FOOT		
P-505-2A	S.F., RETROFIT CONDUIT TRENCH REPAIR _____ _____ PER SQUARE FOOT		
P-605-1A	L.F., COLD APPLIED SEALANT, CONTRACTION, CONSTRUCTION, AND LONGITUDINAL JOINTS _____ _____ PER LINEAR FOOT		
D-751-1A	L.F., REPAIR EXISTING TRENCH DRAIN, SINGLE SIDE _____ _____ PER LINEAR FOOT		

ITEM NO.	ITEM WITH UNIT OR LUMP SUM PRICE WRITTEN IN WORDS	UNIT PRICE IN FIGURES	
		DOLLARS	CENTS
D-751-2A	L.F., REPAIR EXISTING TRENCH DRAIN, TWO SIDES		

	PER LINEAR FOOT		

EXHIBIT "C"

FORM E. SAFETY PROGRAM

Addendum No. 1

The Bidder must demonstrate that it is committed to implementing a first rate safety program and that it has an exceptional safety and environmental record. The Bidder and its essential subcontractors identified on Form B must submit their current Experience Modification Rate (EMR). If an EMR is not available Bidder or essential subcontractor must submit a written statement detailing the Firm's safety record on its last five projects including contact names and numbers where the City can verify the safety record statement.

The Bidder must provide a Log and Summary of OSHA violations and any fines or settlements of its Company, Firm, or joint venture partners for the past thirty-six (36) months. Attach the Log and Summary of Occupational Injuries and Illnesses as required by the U. S. Department of Labor for the past thirty-six (36) months. Provide OSHA Recordable Incident Rate (Year 2009) and OSHA Lost Days Away Incident Rate (Year 2009). This is applicable to site construction and installation activities only.

Bidder is to complete attached Safety and Health History (SHH) form.

SAFETY AND HEALTH HISTORY FORM

1A. List your Firm's Interstate Experience Modification Rate (EMR) for the three (3) most recent years and total hours worked.

	20____	20____	20____
a. EMR	_____	_____	_____
b. Hours Worked	_____	_____	_____

1B. If the state where the jobsite is located has an EMR rating system, provide the state EMR for the three (3) most recent years and total hours worked.

	20____	20____	20____
a. EMR	_____	_____	_____
b. Hours Worked	_____	_____	_____

2. SAFETY PERFORMANCE

2A. List safety performance incident rates for the three (3) most recent years:

	20____	20____	20____
a. OSHA Recordable Incident Rate	_____	_____	_____
b. Lost Workday Case Incident Rate	_____	_____	_____

2B. Use your *OSHA No. 300 Log* to fill in the three (3) most recent years:

	20____	20____	20____
a. Number of first aid cases	_____	_____	_____
b. Number of lost workday cases.	_____	_____	_____
c. Number of restricted workday cases.	_____	_____	_____
d. Number of cases with medical attention only.	_____	_____	_____
e. Number of fatalities.	_____	_____	_____

3. Check your type of work:

<input type="checkbox"/> Non-Residential Building	<input type="checkbox"/> Earthwork
<input type="checkbox"/> Heavy (Non-Highway) Construction	<input type="checkbox"/> Concrete
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Architectural
<input type="checkbox"/> Electrical	
<input type="checkbox"/> Other (State Type): _____	

SAFETY AND HEALTH HISTORY (Continued)

4. Are accident reports (*OSHA 300*) and report summaries sent to the following and how often?

	No	Yes	Monthly	Quarterly	Annually
a. Project Superintendent/Site Mgr.	—	—	—	—	—
b. Vice President/Mgr. of Construction	—	—	—	—	—
c. Safety Director	—	—	—	—	—
d. President of Firm —	—	—	—	—	—

5. Do you hold site safety meetings for field employees both Manual and Non-Manual?

Yes — No —

How Often?

Weekly — Bi-Weekly — Monthly — Less Often, As Needed —

6. Do you conduct project safety inspections?

Yes — No —

If yes, who conducts this inspection?

TITLE

HOW OFTEN?

7. How are accident records and accident summaries kept? How often are they reported?

	No	Yes	Monthly	Annually
a. Accidents totaled for the entire company	—	—	—	—
b. Accidents totaled by project —	—	—	—	—
(1) Subtotaled by superintendent	—	—	—	—
(2) Subtotaled by foreman —	—	—	—	—

8. How are the costs of individual accidents kept? How often are they reported?

	No	Yes	Monthly	Annually
a. Costs totaled for the entire company	—	—	—	—
b. Costs totaled by project	—	—	—	—
(1) Subtotaled by superintendent	—	—	—	—
(2) Subtotaled by foreman —	—	—	—	—

SAFETY AND HEALTH HISTORY (Continued)

9. List key Safety and Health personnel planned for this project. Please list name, expected position and safety performance on their last three projects (OSHA Recordable and Lost Workday Case Incident (LWCI) rates). When a project has not been specified, list key company personnel.

NAME	POSITION	PROJECT	OSHA	LWCI

10. Do you have a written safety program?

Yes ____ No ____

If yes, submit a copy for evaluation.

11. Do you have an orientation program for new hires?

Yes ____ No ____

If yes submit a copy for evaluation. Does it include instruction on the following?

	Yes	No		Yes	No
a. Head protection	___	___	i. Fire protection	___	___
b. Eye protection	___	___	j. First aid facilities	___	___
c. Hearing Protection	___	___	k. Emergency procedures	___	___
d. Respiratory protection	___	___	l. Toxic substances	___	___
e. Safety belts and lifeline	___	___	m. Trenching and excavation	___	___
f. Scaffolding	___	___	n. Signs, barricades, flagging	___	___
g. Perimeter guarding	___	___	o. Electrical safety	___	___
h. Housekeeping	___	___	p. Rigging and crane safety	___	___
			q. Road Safety (Driving)	___	___

SAFETY AND HEALTH HISTORY (Continued)

12. Do you have a program for newly hired or promoted foremen?

Yes ☐ No ☐

If yes submit a copy for evaluation. Does it include the following?

	Yes	No		Yes	No
a. Safe work practices	<input type="checkbox"/>	<input type="checkbox"/>	e. First aid procedures	<input type="checkbox"/>	<input type="checkbox"/>
b. Safety supervision	<input type="checkbox"/>	<input type="checkbox"/>	f. Accident investigation	<input type="checkbox"/>	<input type="checkbox"/>
c. Toolbox meetings	<input type="checkbox"/>	<input type="checkbox"/>	g. Fire protection and prevention	<input type="checkbox"/>	<input type="checkbox"/>
d. Emergency procedures	<input type="checkbox"/>	<input type="checkbox"/>	h. New worker orientation	<input type="checkbox"/>	<input type="checkbox"/>

13. Do you hold craft "toolbox" safety meetings?

Yes ☐ No ☐

How Often?

Weekly ☐ Bi-Weekly ☐ Monthly ☐ Less Often, As Needed ☐

14. Do you have a written Hazard Communication program?

Yes ☐ No ☐

If yes, how is it implemented on each project?

15. Do you have/require Safety Data Sheets (*S.D.S.*) for material/chemicals/equipment?

Yes ☐ No ☐

If yes, explain field procedure for informing craft workers about potential hazards:

SAFETY AND HEALTH HISTORY (Continued)

16. List three (3) client references that could verify the quality and management commitment of your safety program.

Name

Address

Phone No.

a. _____

b. _____

c. _____

Exhibit D
OWNER'S CONTROLLED INSURANCE PROGRAM
FC-7757, AIRFIELD REPAIRS 2015

Part 1 – Summary

A. Insurance:

1. Notwithstanding anything to the contrary, in the agreement to which this Appendix is attached or in any other agreement between Contractor, Owner and/or Architect, Construction Manager, General Engineering Consultant, or their respective Subconsultants, Subcontractors, Agents, Employees or Representatives, the parties hereto agree as follows:
2. The City of Atlanta, H-JAIA will employ an "Owner Controlled Insurance Program, "(OCIP) for this project for all activities performed on Airport property. The purpose of the OCIP is to provide one master insurance program that provides broad coverages with high limits that will benefit all participants involved in the project. The Owner, if electing the OCIP, shall procure, pay for and administer the OCIP during the duration of the program. The program will include the following coverages:
 - ☐ Workers' Compensation & Employers Liability
 - ☐ Commercial General Liability
 - ☐ Excess/Umbrella Liability
 - ☐ Contractors Pollution Liability
 - ☐ Builders Risk

- B. The Named Insured shall include the Owner, Contractors and Subcontractors of any tier (excluding suppliers) for whom the Owner has agreed to furnish an OCIP.

- C. Coverage shall be limited to the project site.

Part 2 - Evidence of Insurance Cost

- A. The attached construction insurance information form should be completed for providing estimated payroll and premium data to the insurance carrier and the cost of insurance to be added to your bid. A sample is provided in Section VII, Enrollment Forms.

Specific Instructions:

- ☐ Section I - Worker's Compensation:

Report the classifications, codes, experience, modifier and rates used in your current policy.

- ☐ Section II & III - General and Excess Liability:

Use the current rates applicable to on-site project operations, and separately for completed operations, as outlined in your current policy.

☐ Section V - Lower-Tier Contractors:

If lower-tier Contractors are involved in your type bid, please provide them with a set of these forms and instructions. Copies of the Construction Insurance Information form must be attached to your bid package. The aggregate premiums must equal the amount reported in this section. No coverage provided under the OCIP shall extend to the activities or products of suppliers.

☐ Section VIII - Total Amount Excluded from Bid:

Sum of Sections I - VII

☐ It is recommended that this form be referred to your agent/broker.

B. The Contractor, for the coverages provided under the OCIP, warrants that all insurance charges, except as provided on the information form, are excluded from the bid for this contract and no such coverage is duplicated by the Contractor.

C. The Contractor hereby warrants the accuracy of the information provided on the Contractor Insurance Information form and agrees that the Owner, its insurance representative and/or OCIP carrier, may audit the Contractor's records to confirm the accuracy of any and all insurance credit, including without limitation, in connection with any changes in the work as referenced in this contract. The Contractor also agrees to provide complete certified copies of the current insurance policy(ies) if requested by the Owner to verify insurance deduction accuracy. The Contractor further warrants and agrees that the Owner is entitled to and may collect additional insurance credits as may be developed as a result of said audits.

D. Base Bid

Items under the Base Bid shall include the Contractor's cost of procuring and maintaining only automobile liability insurance.

Part 3 - Insurance Coverages Provided

A. The Owner, at its sole expense, will implement an Owner-Controlled Insurance Program (OCIP) to furnish certain insurance coverages as respects on-site activities. The OCIP will be for the benefit of the Owner and Contractors and Subcontractors of all tiers (unless coverage applies only to work performed under the Contract at the project site and the Contractor and all approved Subcontractors must provide their own insurance for off-site activities.

B. **Excluded Contracts** - The OCIP is not intended to cover (1) hazardous materials remediation, removal and/or transport companies, (2) suppliers, vendors, materials dealers or fabricators, (3) truckers, haulers, drivers and those merely transporting materials, equipment, or personnel, (4) contractors/subcontractors not performing work on site, (5) asbestos abatement and hazardous waste (sub)contractors, (6) any subcontracts with a value less than \$20,000, and (7) any contract/subcontract as determined by the Owner.

Unless otherwise addressed by the Owner, these contractors/subcontractors

shall be required to carry their own insurance at their own expense.

Although not covered under the OCIP, all excluded contractors/subcontractors shall be required to complete the online OCIP registration and provide satisfactory evidence of insurance in compliance with all minimum insurance requirements as detailed in ATTACHMENT 1 of this Exhibit D.

- C. The Owner will procure and pay premiums for the following insurance for the Contractor, and Subcontractors of any tier, and other entities covered by these Insurance Specifications:
1. Workers' Compensation and Employer's Liability -
 - a. Statutory - Amount and coverage as required by law including any applicable provision for voluntary Worker's Compensation benefits as required by Labor Union Agreements and including the "All States" endorsement; and
 - b. Employer's Liability - A minimum of:
Bodily Injury by Accident \$1,000,000 Each Accident
Bodily Injury by Disease \$1,000,000 Policy Limit
Bodily Injury by Disease \$1,000,000 Each Employee
 2. Commercial General Liability to cover Contractor and any Subcontractor performing work under the Contract Documents from claims for damages for bodily injury including accidental death as well as from claims for property damages which may arise from operations under the Contract Documents, whether such operations are by Contractor or by any Subcontractor or by anyone directly or indirectly employed by them. Owner shall procure insurance coverage for direct operations, sublet work, elevators, contractual liability and completed operations with limits not less than those stated below:
 - a. Bodily Injury and Property Damage Liability - A minimum of \$2,000,000 per each occurrence and general aggregate;
 - b. Products and Completed Operations Aggregate Limit - A minimum of \$2,000,000 per each occurrence;
 - c. General Aggregate Limit Products and Completed Operations – A minimum of \$5,000,000 annually; Coverage will continue for a period of five (5) years beyond termination and/or substantial completion of the construction program;
 - d. Personal and Advertising Injury Limit – A minimum of \$2,000,000 per each occurrence;
 3. Excess/Umbrella coverage will be provided with a minimum limit of at least \$50,000,000, which provides additional limits in excess of primary limits for Commercial General Liability, Employer's Liability, and Products and Completed Operations.
 4. Builder's Risk Insurance Coverage

- a. The City of Atlanta shall procure and maintain Builder's Risk Insurance on the entire work which provides "All Risk" coverage on the buildings, structure or work, and property of the City of Atlanta/ Hartsfield Jackson Atlanta International Airport in the care, custody and control of the Contractor. The amount of such insurance shall at all times be equal to one hundred percent of the amount paid to the Contractor for work performed, or replacement value, whichever is greater. The policy or policies shall be in the name of the City, and Contractors as their interests shall appear, and this shall be so stated on the ACORD Certificate of Insurance.

The Contractor will assume the responsibility for the first \$25,000 of any claim that is within the purview of this policy.

- b. Coverages:
 - A. "All risk" of physical loss
 - B. Transit
 - C. Off-site storage
 - D. Waiver of subrogation
 - E. Permission to occupy
 - F. No coinsurance clause
 - G. Owner as insured
- c. The City and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Builder's Risk Insurance section, or any other property insurance applicable to the work. The Contractor shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the City, and the Contractor by Subcontractors and Sub-subcontractors. With respect to the waiver of rights of recovery, the terms City and Airport shall be deemed to include, to the extent covered by property insurance applicable thereto, its consultants, employees and such agents and representatives, including the Engineer and the Engineer's consultants, employees and agents. The Contractor waives as against any separate contractor all rights for damages caused by fire or other perils in the same manner as is provided above as against the City. The City shall require, by appropriate agreement written wherever legally required for validity, similar waivers in favor of the Contractor by any separate contractor and its subcontractors and sub-subcontractors.
- d. If the City finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy shall not commence prior to a time mutually agreed to by the City, and the Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. The insurance shall not be canceled or lapsed on account of such partial occupancy. Consent of the Contractor and of the insurance company or companies to such occupancy or use, shall not be

unreasonably withheld.

5. Contractors Pollution Liability

- a. The City of Atlanta will maintain Contractors Pollution Liability coverage for the duration of this contract for on-site activities. The policy will be written with at least a \$10,000,000 limit of liability.

The first \$100,000 of any claims that stems from the operations of the Contractor, its subcontractors or sub-consultants will be fully borne by the Contractor.

- D. Certification and Policies - All Owner furnished insurance coverages outlined above shall be written by insurance company(ies) possessing an A.M. Best's Rating of not less than A-, and Financial Size Category of not less than Class IX. The company(ies) must be authorized to conduct and transact insurance contracts in the State of Georgia. The Owner shall provide all Contractors and Subcontractors with appropriate certificates of insurance evidencing the coverage outlined above. The actual insurance policies will be available for inspection at the Owner's premises.

Part 4 - General Provisions

- A. Each Contractor shall give notice to the Owner, in writing, by certified mail or electronic mail, within two days after the awarding of any contract described in the applicable Contract Documents giving the following information:
 1. Contract Number
 2. Prime Contractor
 3. Legal Name of Subcontractor
 4. Address
 5. Telephone, persons to contact
 6. Estimated Amount of Subcontract
 7. Estimated dates the subcontract work will commence and will be completed
 8. Type(s) of work to be performed
 9. Estimated WORKSITE payroll by Worker's Compensation classification
 10. Present Workers' Compensation experience modification
 11. Present Workers' Compensation Policy anniversary date
 12. Whether or not any work will be sublet under the subcontract and, if so, the names of subcontractors and estimated subcontract amount.
- B. No Contractor shall commence work at the worksite until he has provided a Certificate of Insurance evidencing Primary Insurance Coverages.
- C. The City of Atlanta-H-JAIA, Construction Manager and their Trustees, officers, representatives, agents and employees shall have no responsibility whatsoever to the Contractor with respect to any insurance coverage, its procurement or absence thereof, other than to: (1) No later than five days after receipt by the Owner of a request by Contractor, procure the issuance of a policy naming Contractor as Insured (2) Procure, and pay all premiums for these insurance policies. The policies of insurance procured and maintained hereunder shall not affect the Contractor's liability to the Owner, or Construction Manager for the performance of any obligations assumed by Contractor under the other

applicable Contract Documents of the Owner.

- D. All dividends or refunds payable under any of the policies shall belong to the Owner, and are hereby assigned to the Owner, and the Contractor, at the request of the Owner, shall execute and deliver to the Owner any release, assignment, direction, or authorization which the Owner or any insurance company may require for such purpose.
- E. Contractor shall report, on forms to be provided, any accident and shall assist in every manner reasonable in the investigation of any accident. Upon request, the Contractor shall cooperate with the Owner and the insurance company designated by the Owner in the handling of any claim by securing and giving evidence and requiring the attendance of witnesses as required for any claim or suit.
- F. Contractor shall furnish the Owner and the insurance company designated by the Owner with information to issue any insurance policies to be provided under this Exhibit D.
- G. At the request of the Owner, the Contractor shall attend any meetings held to explain and discuss the coordinated insurance program of the Owner.
- H. Each Contractor shall incorporate a copy of this Manual in each subcontract and shall require each of his Subcontractors of any tier to comply with the requirements in this Exhibit D.
- I. Termination/Modification of the OCIP - While it is the intent of the Owner to keep the OCIP in force throughout the term of the project, the Owner reserves the right to terminate or modify the OCIP or any portion thereof. To exercise this option, the Owner shall provide 45 days advance written notice to all Contractors and Subcontractors and Owner shall immediately obtain replacement insurance coverage the reasonable cost of which will be reimbursed by the Owner. Written evidence of such insurance shall be provided by the Owner prior to the actual termination date of the OCIP.
- J. As respects all property of any Enrolled Contractor or subcontractor of any tier, all contractors performing On-Site Activities waive any rights of recovery of their insurers against the Owner, the construction manager, the design consultant, and their trustees, directors, representatives, agents and employees. All contractors and subcontractors of every tier shall endorse their policies covering tools, equipment and all types of business and personal property with an ISO Endorsement CG 24 04 10 93, Waiver of Transfer of Rights of Recovery Against Others to Us in favor of Owner, construction manager, design consultant and their trustees, directors, representatives, agents and employees.
- K. The Owner shall give any Enrolled Contractor thirty (30) days written notice of cancellation of any applicable policy or policies. In the event of such cancellation, the Owner shall, at its option, at least five days prior to the date of cancellation: (1) procure alternative insurance coverage for the policy or policies canceled; or (2) require Contractor to procure and maintain alternate insurance coverage for the policy or policies canceled, the amounts, contents and carriers of which shall be satisfactory to the Owner. The Owner will reimburse Contractor

for the actual net cost for said Contractor's alternative insurance coverage. In the event of such cancellation these Insurance Specifications shall remain in full force and effect except for those portions, which in the option of the Owner, conflict with said alternate insurance coverage.

- L. Contractor shall not attempt to exercise any right to cancel any of the policies without the expressed written consent of the Owner and any attempted cancellation without said express written consent shall be null and void.
- M. Acceptance of the Contract will be the date all policies automatically terminate, except for coverage afforded under any extension of the completed operations section of the General Liability Policy.
- N. No Release - The carrying of the above-described insurance shall in no way be interpreted as relieving the Contractor of any other responsibility or liability under this agreement or any applicable law, statute, regulation or order.

Part 5 - Contractor Required Coverage A. Contractor shall, at its own expense, purchase and maintain insurance as described below. The company(ies) underwriting such coverage must possess an A.M. Best's Rating of not less than A-, and Financial Size Category of not less than Class IX. The company(ies) must be authorized to conduct and transact insurance contracts in the State of Georgia. If the Contractor/Consultant is a joint venture, the insurance certificate should name the joint venture, rather than the joint venture partners individually, as the primary insured. In addition, all partners must be enrolled in the Owners Controlled Insurance Program.

1. Commercial Automobile – On and Off Site Activities

Automobile, Bodily Injury and Property Damage Liability Insurance covering all automobiles, whether owned, non-owned, leased or hired, with not less than the following limits:

- a. Limit of Liability: **\$2,000,000 Combined Single Limit** for operations away from the Aircraft Operations Area and **\$5,000,000 Combined Single Limit** for operations on the Aircraft Operations Area.

In accordance with Section 22-181(b) of Chapter 22, Code of Ordinances of the City of Atlanta, all vehicles requiring access to the restricted areas of the airport must be covered by an automobile liability policy in the minimum amount of **ten million (\$10,000,000)** combined single limit for personal injury and property damage. The \$10,000,000 limit of liability will also be imposed on any parties transporting workers, materials and/or equipment to the Airport site from parking lots or similar facilities.

- b. If hazardous materials or waste are to be transported, the Commercial Automobile Liability policy will be endorsed with the MCS-90 endorsement in accordance with the applicable legal requirements.

- 2. Aircraft and Watercraft Bodily Injury Liability and Property Damage Liability Insurance - **\$1,000,000** per person and occurrence, if Contractor uses owned or non-owned aircraft and watercraft in his operation. To be

provided at Contractor's own expense.

3. All Risk Contractors' Equipment Insurance covering owned, used and leased equipment. To be provided at Contractor's own expense.
4. Worker's Compensation and Employer's Liability Insurance - Off-Site Activities Only

Georgia Statutory Limits with All States Endorsement and minimum Employer's Liability Limits will be provided as follows:

Bodily Injury by Accident	\$500,000 Each Accident Bodily
Injury by Disease	\$500,000 Policy Limit
Bodily Injury by Disease	\$500,000 Each Employee

- Designated Workplace Exclusion if the Contractor is an Enrolled Contractor
- Waiver of Subrogation in favor of the owner and other entities, as required by contract. A copy of the Waiver of Subrogation endorsement must be attached to the Contractor's Certificate of Insurance

5. Commercial General Liability Insurance - Off-site Activities Only

\$1,000,000 Per Occurrence / \$2,000,000 Products Completed Operations / \$2,000,000 General Aggregate. Coverage must include Bodily Injury and Property Damage including Premises/Operations; Elevators; Broad Form Contractual Liability; Broad Form Property Damage; Fire Legal Liability; Independent Contractors and Subcontractors Coverage; Products and Completed Operations Coverage for not less than five years after the date of completion of all of the work; and Personal Injury (deleting employee and contractual exclusions) and, when indicated, coverage for explosion; collapse and underground (X, C, U).

The Owner and its agents shall be included as additional insureds under these policies on a primary and non-contributory basis. Waiver of Subrogation to be provided to all Additional Named Insureds

In the event the Contractor neglects, refuses or fails to provide the insurance required by the Contract Documents, or if such insurance is canceled for any reason, the Owner shall have the right but not the duty to procure the same, and the cost thereof shall be deducted from monies then due or thereafter to become due to the Contractor.

6. Umbrella/Excess Liability

Umbrella/Excess liability insurance, insuring against bodily injury, property damage and personal and advertising injury, may be used to meet the limits specified above for Employers' Liability, Commercial General Liability and Commercial Automobile Liability. The General Liability and Automobile Liability limit requirement may be met by primary coverage or a combination of primary and umbrella/excess insurance.

- a. Commercial General Liability, Business Automobile Liability, and Employers' Liability must include follow-form wording.

7. Professional Liability Insurance (Architecture & Engineering Design only)

Contractor/Consultant shall procure and maintain during the life of this contract Professional Liability Insurance in an amount of **\$5,000,000** Per Loss and Total Losses. The policy will fully address the Contractor/Consultant's professional services associated with the scope of work contained in this document. The policy will include a three year Extended Reporting Provision.

- B. Prior to beginning work at worksite (as defined in the applicable Contract Documents of the Owner), each contractor shall furnish certificates of insurance satisfactory to the Owner as to contents and carriers. All such certificates of insurance must reflect the following provisions:

- 1. Forty-five (45) day prior notice to the Owner of cancellation
- 2. The City of Atlanta and Hartsfield Jackson Atlanta International Airport shall be named as Additional Insureds. General Liability, Auto Liability and Excess Liability policies to be on a primary and non-contributory basis. Waiver of Subrogation to be in favor of Additional Named Insured

Part 6 - Claim and Accident Reporting Procedures

The immediate reporting of all circumstances which might lead to, or involve a CLAIM is a requirement and non-compliance may jeopardize coverage. Refer all questions to the Owner's Construction Manager and or the Owner's insurance carrier. The following are minimum requirements for specific circumstances:

A. Fatal and Serious Accidents (Employees and members of the public)

- ☐ Secure emergency medical services
- ☐ Telephone, in the following order
 - a. Owner's Representative(s)
 - b. Construction Manager

B. Workers' Compensation – An Employer's First Report of Injury report shall be completed for all employees becoming injured or sick during the course of employment.

- ☐ Original and one copy to Owner's Representative(s)
- ☐ Two copies to Construction Manager
- ☐ One copy for Contractor's Records

C. General Liability Insurance – A Claims Report shall be completed when any member of the public is injured and/or his/her property is damaged, and when injury occurs to personnel or property of other Contractors and/or Subcontractors.

- ☐ Original and one copy to Owner's Representative(s)
- ☐ Two copies to Construction Manager

- ☐ One copy for Contractor's Records
- D. All Risk Course of Construction (sometimes referred to as Builders Risk) – A Claims Report shall be completed when physical damage occurs to any part of the construction works, from whatever cause.
 - ☐ Original to Owner's Representative(s)
 - ☐ Two copies to Construction Manager
 - ☐ One copy for Contractor's Records
- E. Automobile Insurance – A Claims Report shall be completed when there is any accident/incident involving an automobile.
 - ☐ Original and one copy to Owner's Representative(s)
 - ☐ Two copies to Construction Manager
 - ☐ One copy for Contractor's Records

**City of Atlanta, Department of Aviation
Atlanta Hartsfield International Airport Expansion Project
Insurance Program**

Insurance Information Form (Page 1)

Contractor Name:

Subcontractor To

(if applicable):

Address:

Phone:

Project Name: _____

Contract No.: _____

Contract Amount: _____

Est. Payroll: \$ _____

Est. Start Date: _____

Est. End Date: _____

- I. Workers' Compensation Information (Project Site Only):
(See next two pages for classification codes).

		Current Rate x Payroll	
<u>Classifications</u>	<u>W. C. Code</u>	<u>Per \$100 of Payroll</u>	<u>Premium</u>
1. _____	_____	\$ _____ X \$ _____	= \$ _____
2. _____	_____	\$ _____ X \$ _____	= \$ _____
3. _____	_____	\$ _____ X \$ _____	= \$ _____
4. _____	_____	\$ _____ X \$ _____	= \$ _____
5. _____	_____	\$ _____ X \$ _____	= \$ _____

(Attach Worksheet if more than five codes are used)

Totals: \$ _____ \$ _____

Experience Modifier:

X

Modifier Premium:

Employers' Liability (Coverage One -B):

+

Total Modified Premiums:

\$

Regular Workers' Compensation Insurer:

_Experience Rating Date (Policy Effective Date):

_Interstate Bureau I.D. #

_Federal Employer I.D.#

**City of Atlanta, Department of Aviation Atlanta
Hartsfield International Airport Expansion Project
Insurance Program**

Insurance Information Form (Page 2)

Classifications Premium	GL Code	Current Rate x Payroll Per \$100/\$1000 of Payroll
II. General Liability:		\$ _____ X \$ _____ = \$ _____
III. Excess/Umbrella Liability		\$ _____ X \$ _____ = \$ _____
IV. Completed Operations (Five Years)		\$ _____ X \$ _____ = \$ _____
V. Lower-Tier Contractor Premium (Excluding Auto):		= \$ _____
VI. Total Premium (I+II+III+IV+V):		\$ _____
VII. Overhead and Profit on Insurance Premiums:		+ \$ _____
VIII. Total Amount Excluded from Bid (VI + VII):		\$ _____

Agreement: Contractor agrees to permit the City of Atlanta or its Agent to inspect the insurance policies and payroll records used in determining the premium cost outlined above. (As per the General Conditions of the Contract).

Signed by: _____ Title: _____

Print Name: _____ Date: _____

Contractor's Insurance Broker or Agent:

Name: _____ Contact: _____

City: _____ Phone: _____
(Include Area Code)

Workers' Compensation Classification Codes

Code	Description
8601	Architect, or Engineer – Consulting
5188	Automatic Sprinkler Head Installation
5190	Cable Installation and Drivers
5403	Carpentry
5437	Carpentry-Trim and Cabinet
5610	Cleaner-Debris Removal
8810	Clerical Office Employees
5213	Concrete Construction
5221	Concrete or Cement Work-Floors, Driveways, Yards or Sidewalks and Drivers
6325	Conduit Construction – For Cables or Wires, and Wires and Drivers
5606	Contractor – Executive Supervisor
6229	Drainage or Irrigation System Construction, and Drivers
6204	Drilling NOC and Drivers
3724	Electrical Apparatus Installation or Repair, and Drivers
7538	Electrical light or Power Line Construction, and Drivers
5190	Electrical Wiring
5160	Elevator Erection or Repair
6217	Grading or Land, and Drivers
6400	Fence Erection – Metal
9521	Floor Covering Installation
6319	Gas, Steam, or Water Main Connection, and Drivers
5462	Glaziers – Away from Shop
6217	Grading or Land, and Drivers
5479	Insulation Work NOC
5057	Iron and Steel Erection
6229	Irrigation System Construction
0042	Landscape Gardening
5022	Masonry
3724	Milwright work, and Drivers
6003	Pile Driving
5183	Plumbing, and Drivers
7219	Rigging, and Drivers
6306	Sewer Construction – All Preparation, and Drivers
Code	Description

5538	Sheet Metal Work – Shop and Outside, and Drivers
5703	Shoring (including Sheeting, Bracing, Decking, etc.)
3726	Tank Erection or Repair – Metal – Within Buildings
5445	Wallboard Installation

Other

ATTACHMENT 1

CITY OF ATLANTA HARTSFIELD JACKSON ATLANTA INTERNATIONAL AIRPORT OCIP INSURANCE REQUIREMENTS – EXCLUDED CONTRACTORS

- ♦ Evidence of insurance is required before any work can begin
- ♦ Insurance certificates must satisfy required coverages and limits
- ♦ Additional Insured Endorsements must be provided for general & auto liability
- ♦ Insurance must be maintained for the duration of work on the project
- ♦ Insurers must possess AM Best ratings of A- IX or better
- ♦ Certificate Holder: City of Atlanta
68 Mitchell Street, Ste. 9100
Atlanta, Georgia 30303

Worker's Compensation	Statutory
Employer's Liability	\$500,000 each accident \$500,000 each disease \$500,000 policy limit
Commercial General Liability	\$1,000,000 per occurrence
Personal Injury	\$1,000,000 each injury
Products/Completed Operations	\$2,000,000 annual aggregate
General Aggregate	\$2,000,000
Automobile Liability	\$2,000,000 CSL for BI/PD (away from Airside) \$5,000,000 CSL for BI/PD (on Airside) \$10,000,000 CSL for BI/PD (restricted access Airside)

In accordance with Section 22-181(b) of Chapter 22, Code of Ordinances of the City of Atlanta, all vehicles requiring access to the restricted areas of the airport must be covered by an automobile liability policy in the minimum amount of **ten million (\$10,000,000)** combined single limit for personal injury and property damage. The \$10,000,000 limit of liability will also be imposed on any parties transporting workers, materials and/or equipment to the Airport site from parking lots or similar facilities.

Excess Liability	May be used to achieve minimum limits General Contractor Only: \$10,000,000 Each Occurrence/Aggregate
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SECTION SP-14 RAPID RESPONSE REPAIR ALLOWANCE

01) DESCRIPTION

- a) This item shall consist of additional pavement repair work to be accomplished at the direction of the Owner. It shall include ***spall repairs, concrete pavement replacement, and trench drain repairs as identified by the Owner.***
- b) Work under this item shall be completed after substantial completion, but before final closeout. ***Typical duration of construction per response will be 2 to 4 days. Owner's expectation is that bidder respond and execute work within 30 days of notification.***
- c) It is expected that work under this item will be accomplished utilizing construction items established under the other sections of these specifications. These sections include, but may not be limited to, SP-1, P-504, P-505, P-605, and D-751. ***Quantity of work will be identified on an as needed basis.***

02) GENERAL PROCEDURES

- a) All work performed under this section shall comply with the various sections of these specifications which are appropriate to the specific items involved. This work shall be further described, by the Engineer, in written form and/or on modifications to the contract drawings or on supplemental drawings. In any event, no work will be allowed under this section without the prior approval of the Engineer.

03) MEASUREMENT AND PAYMENT

- a) Measurement and payment for work accomplished under this section shall be in accordance with the various sections of these specifications corresponding to the specific items of work involved and the contract unit price bid and accepted for these items. Payment for items SP-1-1A, ***SP-1-2A, SP-1-3A***, P-504-5A, P-504-6A, P-505-1A, P-505-2A, P-605-1A, D-751-1A, and D-751-2A will be made at the prices shown on *Form A-1, Unit Pricing for SP-14 Rapid Response Repair Allowance*.
- b) ***Mobilization shall include all costs incurred prior to the beginning of work and operations that may be incidental to the project site. These costs shall include badging, bonding, insurance, traffic control, AMA escorting, overhead and profit.***
- c) ***Any unforeseen conditions discovered during course of construction will be addressed using SP-2 Project Contingency Allowance***

04) BASIS OF PAYMENT

- a) Payment will be made under:

Item SP-1-1A – Mobilization per Response for Concrete Pavement Replacement

Item SP-1-2A – Mobilization per Response for Spall and Conduit Trench Repairs

Item SP-1-3A – Mobilization per Response for Trench Drain Repairs

Item P-504-5A – High Early Strength Cement Non-Reinforced Concrete Pavement, 22" Thick

Item P-504-6A – High Early Strength Cement Reinforced Concrete Pavement, 22" Thick

Item P-505-1A – Concrete Pavement Spall Repair

Item P-505-2A – Retrofit Conduit Trench Repair

Item P-605-1A – Cold Applied Sealant, Contraction, Construction, and Longitudinal Joints

Item D-751-1A – Repair Existing Trench Drain, Single Side

Item D-751-2A – Repair Existing Trench Drain, Double Side

END OF SECTION SP-14

SECTION P-501

PORTLAND CEMENT CONCRETE PAVEMENT

01) DESCRIPTION

- (a) This work shall consist of pavements composed of Portland Cement Concrete, with or without reinforcements as specified, constructed on a prepared subgrade or subbase course in accordance with these specifications and shall conform to the thickness and typical cross sections shown on the plans and with lines and grades established by the Contractor.

- (b) The Contractor will be required to construct a test section of approximately 300 linear feet in length at the proposed plan width. This test section is to be paved prior to proceeding with the production paving utilizing the equipment, methods, and materials the Contractor has submitted for the work to be constructed under this contract.

The test section shall be checked by the Contractor in the presence of the Engineer to verify acceptability and compliance with the tolerances and other contract requirements. Work not meeting the requirements will be removed and/or corrected by methods approved by the Engineer.

- (c) This section shall also include the replacement of damaged and/or deficient soil cement stabilized base course, capping of underdrain trenches, concrete fill in the trench above the longitudinal underdrain with low slump, low strength concrete. Mix design and placement methods shall be in general accordance with the requirements of this section.

02) MATERIALS

All aggregates shall be sourced from producers on the most recent Georgia Department of Transportation Office of Materials and Research Qualified Products List. Gradation will be performed at the frequency of one per day for each material for each day of the stockpiling or production.

All aggregates, including sand and stone, for use in concrete shall be tested for alkali-aggregate reaction in accordance with either ASTM C1260 or ASTM C1293. Expansions less than 0.08% at 14 days in the caustic soak solution in ASTM C1260 or less than 0.04% at one year in ASTM C1293 shall indicate that the aggregate is considered non-deleteriously reactive. Aggregates at or above these limits shall be considered potentially deleteriously reactive. Use of aggregates at or above these limits (i.e., aggregates that are potentially deleteriously reactive) shall require testing of the proposed concrete mix design to demonstrate control of deleterious expansion from ASR. The tests to demonstrate control of the mix shall be either a modified version of ASTM C1260 or ASTM C1293. The modification is that any mineral or lithium admixtures in the mix design shall be included in the cementitious portion of the batch of materials to be tested, and at the same weight percentages as designed for use in the concrete mixture being evaluated. Furthermore, in the case of ASTM C1260, the caustic soak storage solution shall be modified to incorporate the lithium admixture as described in the FHWA Publication No. FHWA-RD-03-047, pages 61 – 62, if lithium admixture is incorporated in the concrete mix design. Expansions less than 0.08% at 28 days in the caustic soak solution in the modified ASTM C1260 or less than 0.04% at two years in the modified ASTM C1293 shall be indicative of control of deleterious expansions from ASR. Aggregates shall also be tested for alkali-carbonate reaction in accordance with the criteria stated in ASTM C33. Aggregates shown to be alkali-carbonate reactive shall not be used.

- (a) Fine Aggregate. Fine aggregate for concrete shall be natural sand and shall conform to the requirements of ASTM C33 and AASHTO M-6 and shall meet the gradation requirements of Table I.

TABLE I

Gradation For Fine Aggregate

<u>Sieve Designation</u> <u>(Square Openings)</u>	<u>Percentage by Weight</u> <u>Passing Sieve</u>
3/8 Inch	100
No. 4	95-100
No. 16	45-80
No. 30	25-55
No. 50	10-30
No. 100	2-10

- (b) Coarse Aggregate. Coarse aggregate for concrete shall conform to the requirements of ASTM C33 and AASHTO M80. Coarse aggregate shall be furnished in the two separate sizes as shown in Table II. The coarse aggregate shall show no more than 47% wear when tested in accordance with ASTM C131 and/or ASTM C535.

TABLE II

Gradations from 1-1/2 Inch to No. 4

<u>Sieve Designation</u> <u>(Square Openings)</u>	<u>Percentage By Weight Passing Sieves (AASHTO T-27)</u>						
	<u>2"</u>	<u>1-1/2"</u>	<u>1"</u>	<u>3/4"</u>	<u>3/8"</u>	<u>No. 4</u>	<u>No. 8</u>
1-1/2" to 3/4"	100	90-100	20-55	0-15	0-5	-	-
3/4" to No. 4	-	-	100	90-100	10-55	0-10	0-5

- (c) Cement. The cement used shall be Portland cement conforming to one of the following specifications:

Portland Cement.....ASTM C150, Type I or Type II

Cement supplied for use in concrete shall be of the low alkali type, the total alkali content to be less than 0.40%.

If for any reason cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.

- (d) Premolded Joint Filler. Premolded joint filler for expansion joints shall conform to the requirements of AASHTO M 213 and shall be punched to admit the dowels where called for on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the Engineer. When the use of more than one piece is authorized for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the Engineer.
- (e) Joint Sealer. The joint sealer for the joints in the concrete pavement shall be as

specified in Section P-605 Joint Sealing Filler.

- (f) Dowel and Tie Bars. Dowel and tie bars shall conform to the requirements of AASHTO M 31 or AASHTO M 42, except that rail steel shall not be used for tie bars that are to be bent or re-straightened during construction. Tie bars shall be deformed bars. Dowel bars shall be plain round bars of the size specified and shall be free from burring or other deformation restricting slippage in the concrete. Before delivery to the construction site, one-half of the length of each dowel bar shall be painted with one coat of paint.
- (g) Water. Water used in mixing or curing shall be as clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product as possible. Water will be tested in accordance with and shall meet the suggested requirements of AASHTO T-26. Water known to be of potable quality may be used without testing. Where the source of water is relatively shallow, the intake shall be so enclosed as to exclude silt, mud, grass, or other foreign materials.
- (h) Cover Materials For Curing. Curing materials shall be liquid membrane-forming compounds for curing concrete and shall conform to ASTM C 309, Type 2, Class B. Apply at the rate of no more than 125 square feet per 1 gallon.
- (i) Admixtures. The use of any material added to the concrete mix shall be approved by the Engineer. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below for the admixtures for which approvals are desired. In addition, the Engineer may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests will be made of samples taken by the Engineer from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

Pozzolanic admixtures shall be fly ash meeting the requirements of ASTM C-350 or raw or calcined natural pozzolans meeting the requirements of ASTM C-402.

Air-entraining admixtures shall meet the requirements of AASHTO M 154 or ASTM C-260. Concrete to be tested for approval shall be made with the cement and aggregate to be used in the work and shall contain an air content of 4% to 6% by volume of the concrete mixture, as determined by ASTM C-231.

Water-reducing, set-controlling mixture shall meet the requirements of ASTM C-494, Type A, water-reducing or Type D, water-reducing and retarding and shall be added to all mixes. Type A shall be added when temperatures are below 65°F., and Type D when temperatures are above 65°F. Water-reducing admixtures shall be added at the mixer separately from air-entraining admixtures in accordance with the manufacturer's printed instructions. The water-reducing, set-controlling and retarding admixtures shall not contain calcium chloride or chloride containing compounds as a functional ingredient."

Lithium admixtures used for control of deleterious expansion from ASR shall meet the specifications described in the AASHTO Guide Specification for Highway Construction, Section 56X, Portland Cement Concrete Resistant to Excessive Expansion from Alkali Silica Reaction, section 713.04 (lithium nitrate aqueous admixture).

The quantity of lithium admixture required will be 0.6 gallons per cubic yard of concrete using low alkali cement (0.4% or less alkali), aggregates that have expansions less than 0.04% at 14 days in the caustic soak solution in ASTM C1260 and a low CaO Class F fly ash. There are aggregates in the Atlanta region that met the requirements. It is the contractor's

responsibility to perform ASTM C1260 on the aggregates prior to stockpiling on site to determine that they meet the requirements if these locally available aggregates are not used. If the aggregates do not meet the requirements then it is the contractor's responsibility (at the contractor's cost) to put the proper amount of lithium admixture in the mix to account for the variation.

- (j) Fly Ash. Fly ash shall be used as an additive in concrete to promote workability and plasticity. Fly ash shall be used as a partial replacement for portland cement in concrete in accordance with the following:

- 1) The quantity of fly ash in the mix shall be 25% of the weight of total cementitious material (i.e., Portland cement plus fly ash).
- 2) The fly ash shall conform to ASTM C-618, Type F, except that the loss on ignition shall not exceed 3%. The fly ash should have a maximum of 1.5% available alkali and a maximum 6% CaO.
- 3) Separate facilities must be provided for the fly ash such that it will be stored in the same fashion as cement and batched and weighed to the same degree of accuracy as required for cement. The same scales may be used for weighing both cement and fly ash provided they are handled as a separate operation.
- 4) The Contractor shall assume full responsibility for obtaining concrete having the minimum strength requirements set forth in the specifications.
- 5) A minimum of five and one-half (5½) bags of Portland cement, at 94#/bag, per cubic yard of concrete shall be used in the mix.

- (k) Steel Reinforcement. Deformed welded wire fabric conforming to the requirements of AASHTO M-55 or M-221 shall be used where specified on the plans.

- (l) Shrinkage Reducing Admixture

- 1) Calcium Chloride is not permitted; no chemical admixtures which contain more than 0.1 percent chloride, by weight will be permitted for use.
- 2) Admixtures to be used in the mix shall be incorporated into the mix design submitted for approval. Shrinkage reducing admixture shall be added at the end as is (do not premix with water). ***Dosage rate and mixing sequences shall be per the manufacturer's recommendations. Contractor to coordinate with manufacturer.***
- 3) Shrinkage Reducing Admixture shall have the following characteristics:
 - a. Designed to ***expand at a rate that closely compensates for the shrinkage of the concrete mix and reduces the capillary surface tension of the concrete pore water.***
 - c. Provides at least 80 percent shrinkage ***cracking*** reduction as ***measured and documented by field performance.***
 - d. Formulated for use in freezing and thawing weather.
 - e. ***Shall have documented performance of ASTM C1581, Ring Test, run with concrete (maximum aggregate size not to exceed 0.5 inches): No cracking for minimum 120 days.***

- g. PREVent-C manufactured by Premier Magnesia, Construction Products Group is basis of design.

03) CONSTRUCTION METHODS

- (a) Equipment. Equipment and tools necessary for handling materials and performing all parts of the work shall be approved by the Engineer as to design, capacity, and mechanical condition. The equipment shall be at the job site sufficiently before the start of construction operation for examination and approval.

1) Batching Plant and Equipment.

- i) General. The batching plant shall include bins, weighing hoppers, and scales for the fine aggregate and for each size of coarse aggregate. If bulk cement is used, a bin, hopper, and separate scale for cement shall be included. The weighing hoppers shall be properly sealed and vented to preclude dusting during operation.
- ii) Bins and Hoppers. Bins with adequate separate compartments for fine aggregate and for each required size of coarse aggregate shall be provided in the batching plant. Each compartment shall discharge efficiently and freely into the weighing hopper. Means of control shall be provided so that, as the quantity desired in the weighing hopper is approached, the material may be added slowly and shut off with precision. A port or other opening for removing an overload of any one of the several materials from the hopper shall be provided. Weighing hoppers shall be constructed to eliminate accumulations of tare materials and to discharge fully.
- iii) An automatic recording device capable of recording all of the individual ingredients of the mix shall be installed at the point of manufacture of the concrete.
- iv) Scales. The scales for weighing aggregates and cement shall be of either the beam or the spring less dial type. They shall be accurate within 0.5% throughout their range of use. When beam-type scales are used, provision, such as "tell-tale" dial, shall be made for indicating to the operator that the required load in the weighing hopper is being approached.

A device on the weighing beams shall clearly indicate critical position. Poises shall be designed to be locked in any position and to prevent unauthorized change. The weight beam and "tell-tale" device shall be in full view of the operator while charging the hopper, and he shall have convenient access to all controls.

Scales shall be inspected and sealed as often as the Engineer may deem necessary to assure their continued accuracy. The Contractor shall have on hand not less than ten 50-pound weights for frequent testing of all scales.

2) Mixers

- i) General. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. Each mixer shall have attached in a prominent place a manufacturer's plate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing

drum or blades.

A device, accurate within 3% and satisfactory to the Engineer, shall be provided at the mixer for determining the amount of air-entraining agent that is added to each batch requiring such admixture.

Mixers shall be examined daily for the accumulation of hard concrete or mortar and the wear of blades.

- ii) Mixers at construction sites. Mixing shall be in an approved mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the specified mixing period, and of discharging and distributing the mixture without segregation on the prepared grade. The mixer shall be equipped with an approved timing device which will automatically lock the discharge lever when the drum has been charged and release it at the end of the mixing period. The device shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is released. In case of failure of the timing device, the mixer may be used for the balance of the day while it is being repaired, providing that each batch is mixed 90 seconds. The mixers shall be cleaned at suitable intervals. The pickup and throwover blades in the drum(s) shall be repaired or replaced when they are worn down 3/4 inch or more. The Contractor shall have available at the job site a copy of the manufacturer's design, showing dimensions and arrangements of blades in reference to original height and depth, or provide permanent marks on blades to show points of 3/4 inch wear from new conditions. Drilled holes of 1/4 inch diameter near each end and at the midpoint of each blade are recommended.
- iii) Central plant mixers. Mixers for central plant mixing (plant mixer, revolving drum type mixer, single opening revolving truncated drum mixer, and a revolving drum charging at one end and discharging at the other end) shall have attached thereto, in a prominent place by the manufacturer, a metal plate or plates on which is plainly marked the various uses for which the equipment is designed, the normal capacity (in cubic feet) of the drum or container in terms of the volume of mixed concrete, and the speed of rotation of the mixing drum or blades. Central plant mixers shall be equipped with an acceptable timing device that will not permit the batch to be discharged until the specified mixing time has elapsed. The water system for a central mixer shall be either a calibrated measuring tank or a meter and shall not necessarily be an integral part of the mixer.

The mixers shall be cleaned at suitable intervals. They shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or to wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch or more. The Contractor shall provide the Engineer with a copy of the manufacturer's design showing dimensions and arrangement of blades in reference to original height and depth.
- iv) Truck Mixers and Truck Agitators. Truck mixers used for mixing and hauling concrete, and truck agitators used for hauling central mixed concrete, shall conform to the requirements of AASHTO M 157.
- v) Non-agitator Trucks. Non-agitating hauling equipment shall conform to the requirements of AASHTO M 157.

3) Finishing Equipment.

- i) Finishing machine. The finishing machine shall be self propelled and equipped with at least two oscillating type transverse screeds.
- ii) Vibrators. Vibrators, for full width vibration of concrete paving slabs, may be either the surface pan type or the internal type with either immersed tube or multiple spuds. They may be attached to the spreader or the finishing machine, or they may be mounted on a separate carriage. They shall not come in contact with the joint, load transfer devices, subgrade, or side forms. The frequency of the surface vibrators shall be not less than 3,500 impulses per minute and the frequency of the internal type shall be not less than 5,000 impulses per minute for tube vibrators and not less than 7,000 impulses per minute for spud vibrators.

When spud internal vibrators are used adjacent to forms, they shall have a frequency of not less than 3,500 impulses per minute.

- 4) Concrete Saw. When sawing of joints is elected or specified, the Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions and at the required rate. The Contractor shall provide at least one standby saw in good working order. An ample supply of saw blades shall be maintained at the site of the work at all times during sawing operations.

The Contractor shall provide adequate artificial lighting facilities for night sawing. All of this equipment shall be on the job both before and at all times during concrete placement. Immediately after the initial sawing, the Contractor shall flush out the slurry in the joint with water and install a backer rod slightly larger in diameter than the width of the saw cut, at the bottom of the saw cut. The length of the backer rod shall be extended approximately 6" beyond the slab edge for future overlap of the adjacent slab.

- 5) Forms. Straight side forms shall be made of metal having a thickness of not less than 7/32" and shall be furnished in sections of not less than 10 feet in length. Forms shall have a depth equal to the prescribed edge thickness of the concrete, without horizontal joint, and a base width equal to the depth of the forms. Flexible or curved forms of proper radius shall be used for curves of 100 foot radius or less. Flexible or curved forms shall be of a design acceptable to the Engineer. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Flange braces shall extend outward on the base not less than two-thirds the height of the form. Forms with battered top surfaces, and bent, twisted, or broken forms shall be removed from the work. Repaired forms shall not be used until inspected and approved. Built-up forms shall not be used, except as approved by the Engineer. The top face of the form shall not vary from a true plane more than 1/8 inch in 10 feet, and the upstanding leg shall not vary more than 1/4 inch. The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting.

- (b) Form Setting. Forms shall be set sufficiently in advance of the concrete placement. After the forms have been set to correct grade, the grade shall be thoroughly tamped, either mechanically or by hand, at both the inside and outside edges of the base of the forms.

Forms shall be staked into place with not less than 3 pins for each 10 foot section. A pin shall be placed at each side of every joint. Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/4 inch at any point. Excessive settlement or springing of forms under the finishing machine will not be tolerated. Forms shall be cleaned and oiled prior to the placing of concrete.

The alignment and grade elevations of the forms shall be checked and corrections made by the Contractor immediately before placing the concrete. When any form has been disturbed or any grade has become unstable, the form shall be reset and rechecked.

- (c) Conditioning of Underlying Course. Ruts or depressions caused by hauling or usage of other equipment shall be filled, as they develop, with suitable material to the satisfaction of the Engineer. A multiple-pin template weighing not less than 1,000 pounds (per 20 foot machine) or other approved template shall be provided and operated on the forms immediately in advance of the placing of the concrete. If the mixer is operated upon the grade, the template shall be operated between the mixer and the spreader; in any case, it shall be propelled only by hand and plates shall be adjustable so that they may be set and maintained at the correct contour of the underlying course. The adjustment and operation of the template shall be such as will provide an accurate retest of the grade before placing the concrete thereon. All excess material shall be removed. If the grade is found to be below the true elevation, the depressions shall be filled with approved material and thoroughly compacted to the proper cross section by rolling or tamping with a hand tamp.
- 1) The template shall be maintained in accurate adjustment, at all times by the Contractor, and should be checked daily.
 - 2) The work described under the foregoing paragraphs does not contemplate a regular subgrading operation, but rather a final accurate check of the underlying course.
- (d) Handling, Measuring and Batching Materials. The batch plant site, layout, equipment, and provisions for transporting material shall assure a continuous supply of material to the work. Stockpiles shall be built up in layers of not more than 3 feet in thickness. Each layer shall be completely in place before beginning the next, which shall not be allowed to "cone" down over the next lower layer. Aggregates from different sources and of different gradings shall not be stockpiled together.
- 1). Aggregates shall be handled from stockpiles or other sources to the batching plant in such manner to secure the specified grading of the material. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Rail shipments requiring more than 12 hours will be accepted as adequate binning only if the car bodies permit free drainage. In case the aggregates contain high or non-uniform moisture content, storage or stockpile periods in excess of 12 hours may be required by the Engineer.
 - 2). The fine aggregate and each size of coarse aggregate shall be separately weighed into hoppers in the respective amounts set by the job mix. Cement shall be measured by the sack or by weight. Separate scales and hoppers, with a device to indicate positively the complete discharge of the batch of cement into the batch box or container, shall be used for weighing the cement. Ninety-four pounds of bulk cement shall be considered one sack. Batches involving fractional sacks shall not be allowed, except when bulk cement is used.

- 3). When mixing is at the site of the work, aggregates shall be transported from the batching plant to the mixer in batch boxes, vehicle bodies, or other containers of adequate capacity and construction to properly carry the volume required. Partitions separating batches shall be adequate and effective to prevent spilling from one compartment to another while in transit or while being dumped. When bulk cement is used, the Contractor shall use a suitable method of handling the cement from weighing hopper or transporting container or into the batch itself for transportation to the mixer, such as a chute, boot, or other approved device, to prevent loss of cement. The device shall be arranged to provide positive assurance of the actual presence in each batch of the entire cement content specified.
- 4). Bulk cement shall be transported to the mixer in tight compartments capable of carrying the full amount of cement required for the batch, or if permitted, between the fine and coarse aggregate. When cement is placed in contact with the aggregates, batches may be rejected unless mixed 1-1/2 hours of such contact. Cement in original shipping packages may be transported on top of the aggregates, each batch containing the number of sacks required by the job mix.
- 5). Batches shall be delivered to the mixer separately and intact. Each batch shall be dumped into the mixer without loss of cement, and when more than one batch is carried on the truck, it shall be dumped without spilling of material from one batch compartment into another. Batching shall be conducted so that the results in the weights of each material required will be within a tolerance of 1% for cement and 2% for aggregates.
- 6). Water may be measured either by volume or by weight. The accuracy of measuring the water shall be within $\pm 1\%$ of required amounts. Unless the water is to be weighed, the water-measuring equipment shall include an auxiliary tank from which the measuring tank shall be filled. The measuring tank shall be equipped with an outside tap and valve to provide checking of the setting, unless other means are provided for readily and accurately determining the amount of water in the tank. The volume of the auxiliary tank shall be at least equal to that of the measuring tank.

Methods and equipment for adding air-entraining agent or other admixtures to the batch, when required, shall be approved by the Engineer. All admixtures shall be measured into the mixer with an accuracy of $\pm 3\%$.

(e) Proportions.

- 1). At least thirty (30) days prior to the start of concrete paving operations and after approval of all material to be used in the concrete, the Contractor shall submit the proportions of the material to produce the specified flexural strength of 650 psi at 28 days and 735 psi at 90 days. During the mix design process, additional beams shall be made to determine the strength at 24 hours, 36 hours and 48 hours. The Contractor shall submit for approval the job mix formula, at his expense, to the Engineer at least thirty (30) days prior to construction. The proportioning shall be approved in writing by the Engineer to the Contractor. Should a change in sources of materials be made, or if different sources of materials are to be used, proportions for these materials shall also be approved in writing by the Engineer before said materials are incorporated into the mix. The approved mix shall be a workable concrete designed for a one (1) inch slump, with one-half ($\frac{1}{2}$) inch as the minimum and one and one-half (1-1/2) inches as the maximum allowable in any specimen and an air content of 4% to 6%. If the Contractor proposes to place concrete by methods

other than slip forming that requires a higher slump, the slump may be increased to a maximum of 2-1/2" provided the Contractor has had a mix designed and approved to the criteria specified herein.

The mix design for the low slump, low strength base course replacement shall follow the general requirements of this section. The concrete shall be designed for a 1" to 2" slump, 5% to 7% air content and a 7 day compressive strength of 2000 psi. The low slump concrete shall also be used for capping the underdrain trenches, duct banks, and conduit trenches in the base materials.

The mix design procedure shall include testing for gradation, specific gravity, fineness modulus, dry rodded unit weight, abrasion, compressive and tensile strengths of cement, slump, air, yield, strength, time of set, shrinkage, and statistical analysis. Sufficient beams shall be cast during the mix design process to adequately determine the strengths at 3 days, 7 days, 14 days, 28 days, and 90 days to insure compliance with the requirements of the contract documents. The use of maturity meters shall be used to monitor and determine the concrete strength. The meters shall be IntelliRock Maturity Meters supplied by Engius of Stillwater, Oklahoma. Curves shall be developed during the mix design process and further proved during the concrete placement.

During construction, the Contractor shall make at least seven (7) beams for each 200 cubic yards, or fraction thereof, placed. Each individual three (3), seven (7) twenty-eight (28) day flexural strength test, consisting of the average of two (2) beam breaks, shall represent that amount of concrete each side of the test location midway to the adjacent test locations or to end of lane, whichever is applicable. The quantity of concrete represented by each test shall be as near as practical to the specified frequency. Beams shall be tested at three (3) and seven (7) twenty-eight (28) and ninety (90) days. The flexural strength average of any four (4) consecutive strength tests, tested at the end of twenty-eight (28) days, shall have an average flexural strength equal to or greater than the specified flexural strength. When the maturity meter curves have been developed to an acceptable level, the frequency of casting test beams will be modified to one set per 500 cubic yards. This shall apply to each approved mix design specifically. When the test specimens fail to conform to the requirements for strength, the Engineer shall have the right to order changes in the concrete sufficient to increase the strength to meet these requirements.

In order to monitor quality control the Contractor shall make test beams and the Contractor shall provide the concrete and adequate facilities for sampling, making, (including the beam molds), storing, curing, and breaking the beams in accordance with the ASTM specifications, at facilities set up by the Contractor at the worksite. Complete records shall be maintained on a daily basis, showing the location, age, test results, standard deviation, consecutive four (4) average, remarks and other data necessary to monitor quality control.

Should any portion of the concrete pavement fail to meet the requirement of the average four (4) consecutive twenty-eight (28) day flexural strength tests, the following shall apply:

- i) Twenty-eight (28) day strengths shall be adjusted for any variation from design strengths in proportion to the square of the thickness as follows:

$$f_{s_{\text{adjusted}}} = \frac{t_{\text{actual}}^2}{t_{\text{design}}^2} \times f_{s_{\text{actual}}}$$

Where: t_{actual} = actual pavement thickness

t_{design} = design thickness

$f_{s_{\text{actual}}}$ = actual 28 day flexural strength

$f_{s_{\text{adjusted}}}$ = adjusted 28 day flexural strength

- ii) If the concrete pavements fail to meet the strength tests after adjustment for thickness, the unit price shall be adjusted for that quantity of concrete as defined by the 200 cubic yards, or 500 cubic yards represented by the beam specimens.

TABLE III

<u>Adjusted Deficiency in Flexure Strength-PSI</u>	<u>Proportional Part of Contract Price Allowed</u>
650 psi and above	100%
649 psi to 645 psi	90%
644 psi to 640 psi	80%
639 psi to 635 psi	70%
634 psi to 630 psi	60%
629 psi to 625 psi	50%

Any adjusted deficiency below 625 psi shall be removed or, if approved by the Engineer, may be left in place without payment.

- (f) Mixing Concrete. The concrete may be mixed at the work site in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials, except water, are emptied into the drum. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements of AASHTO M-157.
- 1). When mixed at work site or in a central mixing plant, the mixing time shall be not less than 50 seconds nor more than 90 seconds. Four seconds shall be added to the specified mixing time if timing starts the instant the skip reaches its maximum raised position. Mixing time ends when the discharge chute opens. Transfer time in multiple drum mixers is included in mixing time. The contents of an individual mixer drum shall be removed before a succeeding batch is emptied therein.
 - 2). The mixer shall be operated at the drum speed as shown on the manufacturer's nameplate on the approved mixer. Any concrete mixed less than the specified time shall be discarded by the Contractor at his expense. The volume of concrete mixed per batch shall not exceed the standard rating plate on the mixer, except that an overload up to 10% above the mixer's nominal capacity may be permitted, provided concrete test data for strength, segregation, and uniform consistency are satisfactory, and provided no spillage of concrete takes place.
 - 3). The batch shall be charged into the drum so that a portion of the mixing water shall enter in advance of the cement and aggregates. The flow of water shall be uniform

and all water shall be in the drum by the end of the first 15 seconds of the mixing period. The throat of the drum shall be kept free of such accumulations as may restrict the free flow of materials into the drum.

- 4). Mixed concrete from the central-mixing plant shall be transported in truck mixers, truck agitators, or nonagitating trucks having special bodies. The time elapsing from the time water is added to the mix until the concrete is deposited in place at the work site shall not exceed 30 minutes when the concrete is hauled in nonagitating trucks, nor 60 minutes when the concrete is hauled in truck mixers or truck agitators.
 - 5). Retempering concrete by adding water will not be permitted. Concrete that is not within the specified slump limits at the time of placement shall not be used. Admixtures for increasing the workability or for accelerating the set will be permitted only when specifically specified for in the contract.
- (g) Limitations of Mixing. No concrete shall be mixed, placed or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.
- 1). Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F., and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F.
 - 2). When concreting is authorized during cold weather, the aggregates may be heated by either steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be so arranged as to preclude the possible occurrence of overheated areas which might injure the materials. Unless otherwise authorized, the temperature of the mixed concrete shall be not less than 50°F., and not more than 80°F., at the time of placement in the forms.
 - 3). If the air temperature is 35°F., or less at the time of placing concrete, the Engineer may require the water and/or the aggregates to be heated to not less than 70°F., nor more than 150°F. Concrete shall not be placed on frozen subgrade nor shall frozen aggregates be used in the concrete.
 - 4). Sufficient cold weather protection shall be provided to cover and protect the freshly placed concrete for a period of a minimum of five (5) days.
 - 6). Placement of concrete during hot weather shall be controlled by various means to maintain the concrete temperature at the time of placement in the forms to 85°F.
- The temperature of the various materials and the final concrete may require the use of several simultaneous cooling methods including covering the aggregate stockpiles, sprinkling the aggregates, chilled water, substituting crushed ice for a portion of the mixing water, and/or any other method to maintain the temperature of the concrete at the time of placement to a maximum of 85° F.
- (h) Placing Concrete. The concrete shall be deposited on the thoroughly moistened grade in such a manner as to require as little rehandling as possible. Unless truck mixers, truck agitators, or non-agitating hauling equipment are equipped with means for discharge of concrete without segregation of the materials, the concrete shall be unloaded into an approved spreading device and mechanically spread on the grade in such a manner as to prevent segregation of the materials. Placing shall be continuous between transverse joints

without the use of intermediate bulkheads. Necessary hand spreading shall be done with shovels, not rakes. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

- 1). Concrete shall be thoroughly consolidated against and along the faces of all forms and along the full length and on both sides of all joint assemblies by means of vibrators inserted in the concrete. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form. In no case shall the vibrator be operated longer than 15 seconds in any one location.
 - 2). Concrete shall be deposited as near to expansion and contraction joints as possible, without disturbing them but shall not be dumped from the discharge bucket or hopper onto a joint assembly unless the hopper is well centered on the joint assembly.
 - 3). Should any concrete materials fall on or be worked into the surface of a completed slab, they shall be removed immediately by approved methods.
- (i) Strike-Off of Concrete and Placement of Reinforcement. Following the placing of the concrete, it shall be struck-off to conform to the cross section shown on the plans and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck-off to such length and depth that the sheet of fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck-off and screeded. Any portion of the bottom layer of concrete which has been placed more than 30 minutes without being covered with the top layer shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.
- 1) Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond.
 - 2) Reinforcing steel with rust, mill scale, or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable AASHTO specification requirement.
 - 3) The Contractor shall, at his option, either place pavement reinforcing manually in the plane shown on the plans and then place the final lift or he may set the reinforcing into place using mechanical equipment to be approved by the Engineer prior to its use, after the placement of the concrete.
 - 4) Mechanical equipment to place the pavement reinforcing after the placement of concrete shall be capable of positioning the pavement reinforcing at the required depth in the wet concrete without damaging the edges and finished surface of the concrete pavement. The Contractor shall use a finishing machine, equipped with side forms, to correct and refinish the surface of the concrete pavement to provide a smooth riding surface in accordance with the requirements of the specifications.
- (j) Joints.

- 1) **General.** Longitudinal and transverse joints shall be constructed as indicated on the plans and in accordance with these requirements. All joints shall be constructed true to line with their faces perpendicular to the surface of the pavement. Joints shall not vary more than 1/4 inch from true line or from their designated position. The vertical surface of the pavements adjacent to all expansion joints shall be finished to a true plane and edged to a radius of 1/4 inch, or as shown on the plans. The surface across the joints shall be tested with a 10 foot straightedge as the joints are finished and any irregularities in excess of 1/8 inch shall be corrected before the concrete has hardened. Transverse joints shall be at right angles to the centerline of the pavement and shall extend the full width of the slab. The transverse joints in succeeding lanes shall be placed in the line with similar joints in the first lane. In the case of widening existing pavements, transverse joints shall be placed in line with similar joints in the existing pavement. All transverse contraction joints shall be saw cut to the depths and widths shown in the plans.
 - i) **Deformed Dowel Bars.** Deformed dowel bars of the dimensions and spacings as shown on the plans shall be installed principally in longitudinal construction joints as shown on the plans. The dowel bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals of 12 inches, unless otherwise specified. They shall be held in position parallel to the pavement surface and midway between the surfaces of the slab.

When deformed dowel bars extend into an unpaved lane, they shall be drilled and epoxy grouted into the poured lane as hereinafter specified, unless threaded bolt or other assembled deformed dowel bars are specified. These bars shall not be painted, greased, or enclosed in sleeves.
 - ii) **Smooth Dowel Bars.** Smooth dowel bars or other load-transfer units of an approved type shall be placed across transverse, longitudinal, or other joints in the manner as specified on the plans. They shall be of the dimensions and spacings as shown and held rigidly in the middle of the slab depth in the proper horizontal and vertical alignment by an approved assembly device to be left permanently in place. When the dowels for longitudinal construction joints extend into an unpaved lane, they shall be drilled and epoxy grouted into the poured lane as hereinafter specified. The dowel or load-transfer and joint devices shall be rigid enough to permit complete assembly as a unit ready to be lifted and placed into position. The portion of each dowel painted with rust preventative paint, as required under Paragraph 02(f) hereinbefore, shall be thoroughly coated with Asphalt MC-70, or an approved lubricant, to prevent the concrete from binding to that portion of the dowel. In lieu of using dowel assemblies at contraction joints, dowel bars may be placed in the full thickness of pavement by a mechanical device approved by the Engineers.
- 2) **Installation.** If the paving mixer is operated from an adjacent lane, any joint materials required shall be set immediately after the final testing of the grade. If the paving mixer is operated from the lane being poured, the materials shall be set immediately after the mixer moves forward to permit as much time as possible for proper installation. All joint materials required shall be put in place on the completed and accepted grade. The materials and joint position shall be either at right angles or parallel to the centerline of the pavement, except for fillets or irregular sections. The top of an assembled joint device shall be set at the proper distance below the pavement surface and the elevation shall be checked. Such devices shall be set to

the required position and line and shall be securely held in place by stakes or other means during the pouring and finishing of the concrete. The premolded joint material shall be placed and held in a vertical position; if constructed in sections there shall be no offsets between adjacent units. Dowel bars shall be checked for exact position and alignment as soon as the joint device is staked in place and the device shall be tested to determine whether it is firmly supported. Any joint installation not firmly and securely supported shall be reset.

- i) When joints in concrete pavements are sawed, the joints shall be cut at the time and in the manner approved by the Engineer. The equipment used shall be as described in paragraph 03(a)4).
- ii) The circular cutter shall be capable of cutting a groove in a straight line; the circular cutter shall produce a slot at least 1/8 inch wide. When shown on the plans or required by the specifications, the top portion of the slot or groove shall be widened by means of a second shallower cut or by suitable and approved beveling to provide adequate space joint sealers. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling or tearing. Sawing shall be carried on both during the day and night as required. The joints shall be sawed at the required spacing consecutively in sequence of the concrete placement, unless otherwise approved by the Engineer.

3). Longitudinal Joints.

- i) Construction. Longitudinal construction joints necessary for lane construction shall be formed against suitable forms made of steel. Wooden forms may be used under special conditions, when approved by the Engineer. The construction joints shall be a butt-type joint with smooth dowel bars or deformed tie-bars, as indicated on the plans. The dowels for this type joint shall be painted and greased. The edges of the joint shall be finished with a grooving tool or edging tool and a space or slot shall be formed along the joint of the dimensions, as indicated, to receive the joint sealing material. Provisions shall be made for the installation of tie bars as noted on the plans.
- ii) Contraction or Weakened-plane Type. The longitudinal groove formed or sawed in the top of the slab shall be installed where indicated on the drawings. The groove shall be formed in the plastic concrete with suitable tools or material to obtain the width and depth specified, or it shall be sawed with approved equipment in the hardened concrete to the dimensions required. When the groove is formed in plastic concrete, it shall be true to line with not more than 1/4 inch variation in 10 feet; it shall be uniform in width and depth; and the sides of the groove shall be finished evenly and smoothly with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The sawed groove shall be straight and of uniform width and depth. In either case, the groove shall be clean cut so that spalling will be avoided at intersections with transverse joints. Tie bars shall be installed across those joints, as shown on the plans.
- iii) Expansion. Longitudinal expansion joints shall be installed where designated on the plans. These shall be of a butt type without load-transfer devices and shall include a premolded expansion material. The thickness of

the concrete at these joints shall be increased by at least 25% of the normal pavement thickness to the nearest inch but not less than 2 inches. This increase shall slope to normal thickness in not less than 10 feet from the joint unless otherwise indicated on the plans or to the nearest joint such as a groove joint. The premolded filler, of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint, except for space for sealant at the top of the slab. The filler shall be securely staked or fastened into position perpendicular to the proposed finished surface.

A metal or wooden cap shall be provided to protect the top edge of the filler and to permit the concrete to be placed and finished. After the concrete has been placed and struck-off, the cap shall be carefully withdrawn leaving the space over the premolded filler. The edges of the joint shall be finished and tooled while the concrete is still plastic. The width of the joint shall be corrected for temperature, nominal width shown on the plans to be at 68°F.

4). Transverse Joints.

- i) Expansion. Transverse expansion joints shall be installed at the locations and spacing as shown on the plans. The joints shall be installed at right angles to the centerline and perpendicular to the surface of the pavement. The joints shall be so installed and finished to insure complete separation of the slabs.

Expansion joints shall be of a premolded type conforming to these specifications and with the plans and shall be the full width of the pavement strip.

All concrete shall be cleaned from the top of the joint material. Before the pavement is opened to traffic this space shall be swept clean and filled with approved joint sealing material.

The filler shall be placed on the side of the installing plate nearest the mixer. The top edge of the filler shall be protected by a metal channel cap of at least 10 gauge material. The installing device may be designed with this cap self-contained.

All devices used for the installation of expansion joints shall be approved by the Engineer. They shall be easily removable without disturbing the concrete and held in proper transverse and vertical alignment. Immediately after forms are removed, any concrete bridging the joint space at the ends shall be removed for the full width and depth of the joint.

When specified, expansion joints shall be equipped with dowels of the dimensions and at the spacing and location indicated on the plans. The dowels shall be firmly supported in place and accurately aligned parallel to the subgrade and the centerline of the pavement by means of a dowel assembly which will remain in the pavement and will insure that the dowels are not displaced during construction.

Other types of load-transfer devices may be used, when approved by the Engineer. The width of the joint shall be corrected for temperature, nominal width shown on the plans to be at 68°F.

- ii) Contraction. Transverse contraction joints, weakened-plane joints, or both,

shall be installed at the locations and spacing as shown on the plans. These joints will be installed by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened in the same manner as specified in paragraph 03)(j)3)ii).

Dowel bar assembly shall be installed when required, as shown on the plans.

- iii) Construction. Transverse construction joints shall be installed in accordance with the details on the plans and ordinarily are only needed when it is necessary to suspend the work for more than 30 minutes. The construction joint shall be located at a planned contraction or expansion joint. The fresh concrete shall be removed back to the previously spaced regular joint.
- iv) Construction of Connection Between New and Existing Pavement. The Contractor shall hand excavate, using extreme care, to the dimensions shown in the plans, adjacent to the edges of all existing pavements to prevent any damage to the existing pavement.

The connection between the new and existing pavements shall be constructed as shown on the plans.

Any damage to the existing pavement caused by the Contractor's operations shall be repaired by him, to the satisfaction of the Engineer at no cost to the Owner.

(k) Final Strike-Off, Consolidation and Finishing.

- 1). Sequence. The sequence of operations shall be the strike-off and consolidation, floating and removal of laitance, straightedging, and final surface finish. The addition of superficial water to the surface of the concrete to assist in finishing operations generally will not be permitted. If the application of water to the surface is permitted, it shall be applied as a fog spray by means of approved spray equipment.
- 2). Finishing at Joints.
 - i) The concrete adjacent to joints shall be compacted or firmly placed without voids or segregation against the joint material; it shall be firmly placed without voids or segregation under and around all load-transfer devices, joint assembly units, and other features designed to extend into the pavement. Concrete adjacent to joints shall be mechanically vibrated as required in paragraph 03(h).
 - ii) After the concrete has been placed and vibrated adjacent to the joints as required in paragraph 03(h), the finishing machine shall be operated in a manner to avoid damage or misalignment of joints. If uninterrupted operations of the finishing machine, to, over, and beyond the joints causes segregation of concrete, damage to, or misalignment of the joints, the finishing machine shall be stopped when the front screed is approximately 8 inches from the joint. Segregated concrete shall be removed from the front of and off the joint; the front screed shall be lifted and set directly on top of

the joint and the forward motion of the finishing machine shall be resumed.

When the second screed is close enough to permit the excess mortar in front of it to flow over the joint, it shall be lifted and carried over the joint. Thereafter, the finishing machine may be run over the joint without lifting the screeds, provided there is no segregated concrete immediately between the joint and the screed or on top of the joint.

3). Machine Finishing.

- i) A belt finish or burlap drag will be acceptable on the taxiway and roadway pavements. The final elevations of all pavements shall not vary more than one fourth (1/4) inch from the finished grade elevations.
- ii) Vibratory Method. When vibration is specified, vibrators for full-width vibration of concrete paving slabs shall meet the requirement specified in paragraph 03)(a)3) ii). If uniform and satisfactory density of the concrete is not obtained by the vibratory method at joints, along forms, at structures, and throughout the pavement, the Contractor will be required to furnish equipment and methods which will produce pavement conforming to the specifications.

When in operation, the screed shall be moved forward on the forms with a combined longitudinal and transverse shearing motion, always moving in the direction in which the work is progressing, and so manipulated that neither end is raised from the side forms during the striking-off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

4). Hand Finishing. Unless otherwise specified, hand finishing methods will not be permitted, except under the following conditions:

- i) In the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade.
- ii) Narrow widths or areas or irregular dimensions where operation of the mechanical equipment is impractical may be finished by hand methods.
- iii) Concrete, as soon as placed, shall be struck-off and screeded. An approved portable screed shall be used. A second screed shall be provided for striking-off the bottom layer of concrete when reinforcement is used.
- iv) The screed for the surface shall be at least 2 feet longer than the maximum width of the slab to be struck-off. It shall be of approved design, sufficiently rigid to retain its shape, and shall be constructed either of metal or of other suitable material, shod with metal.
- v) Consolidation shall be attained by the use of a suitable vibrator or other approved equipment.

5). Floating. After the concrete has been struck-off and consolidated, it shall be further smoothed, trued, and consolidated by means of a longitudinal float, using one of the following methods, as specified or permitted:

- i) Hand Method. The hand-operated longitudinal float shall be not less than 12 feet in length and 6 inches in width, properly stiffened to prevent flexibility and warping. The longitudinal float, operated from foot bridges resting on the side forms and spanning but not touching the concrete, shall be worked with a sawing motion, while held in a floating position parallel to the road centerline and passing gradually from one side of the pavement to the other. Forward movement along the centerline of the pavement shall be in

successive advances of not more than one-half the length of the float. Any excess water or soupy material shall be wasted over the side forms on each pass.

- ii) Mechanical Method. The mechanical longitudinal float shall be approved by the Engineer, and it shall be in good working condition. The tracks from which the float operates shall be accurately adjusted to the required crown. The float shall be accurately adjusted and coordinated with the adjustments of the transverse finishing machine so that a small amount of mortar is carried ahead of the float at all times. The forward speed shall be adjusted so that the float will lap the distance specified by the Engineer on each transverse trip. The float shall pass over each pavement at least two times, but excessive operation over a given area will not be permitted. Any excess water or soupy material shall be wasted over the side forms on each pass.
- iii) Alternative Mechanical Method. As an alternative to paragraph 03(k)5)ii., Contractor may use a machine composed of a cutting and smoothing float(s) suspended from and guided by a rigid frame. The frame shall be carried by four or more visible wheels riding on, and constantly in contact with, the side forms.

If necessary, following one of the preceding methods of floating, long-handled floats having blades not less than 5 feet in length and 6 inches in width may be used to smooth and fill in open-textured areas in the pavement. Long-handled floats shall not be used to float the entire surface of the pavement in lieu of, or supplementing, one of the preceding methods of floating. When strike-off and consolidation are done by hand, and the crown of the pavement will not permit the use of the longitudinal float, the surface shall be floated transversely by means of the long-handled float. Care shall be taken not to work the crown out of the pavement during the operation. After floating, any excess water and laitance shall be removed from the surface of the pavement by a straightedge 10 feet or more in length. Successive drags shall be lapped one-half the length of the blade.

- 6). Straight-edge Testing and Surface Correction. After the floating has been completed and the excess water removed, but while the concrete is still plastic, the surface of the concrete shall be tested for trueness with a 16 foot straightedge. For this purpose the Contractor shall furnish and use an accurate 16 foot straightedge swung from handles 3 feet longer than one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one half the length of the straightedge. Any depressions shall be immediately filled with freshly mixed concrete, struck-off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints

meets the requirements for smoothness. Straightedge testing and surface correction shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross section.

- 7). Final Finish. Taxiways, roadways and other pavements may be finished with either a belt finish, or a burlap drag finish.

i) Belt Finish. If the surface texture is to be a belt finish, when straightedging is completed and water sheen has practically disappeared and just before the concrete becomes non-plastic, the surface shall be belted with a 2-ply canvas belt not less than 8 inches wide and at least 3 feet longer than the pavement width. Hand belts shall have suitable handles to permit controlled, uniform manipulation. The belt shall be operated with short strokes transverse to the centerline and with a rapid advance parallel to the centerline.

ii) Drag Finish. If the surface texture is to be a drag finish, a drag shall be used; it shall consist of a seamless strip of damp burlap and it shall produce a uniform surface of gritty texture after dragging it longitudinally along the full width of pavement. For pavement 16 feet or more in width, the drag shall be mounted on a bridge which travels on the forms. The dimensions of the drag shall be such that a strip of burlap at least 3 feet wide is in contact with the full width of pavement surface while the drag is used. The drag shall consist of not less than two layers of burlap with the bottom layer approximately 6 inches wider than the upper layer. The drag shall be maintained in such a condition that the resultant surface is of uniform appearance and reasonably free from grooves over 1/16 inch in depth. Drags shall be maintained clean and free from encrusted mortar. Drags that cannot be cleaned shall be discarded and new drags substituted.

- 8). Edging at Forms and Joints. After the final finish, but before the concrete has taken its initial set, the edges of the pavement along each side of each slab, and on each side of transverse expansion joints, formed joints, transverse construction joints, and emergency construction joints shall be worked with an approved tool and rounded to the radius required by the plans. A well-defined and continuous radius shall be produced and a smooth, dense, mortar finish obtained. The surface of the slab shall not be unduly disturbed by tilting of the tool during use.

At all joints, any tool marks appearing on the slab adjacent to the joints shall be eliminated by brooming the surface. In doing this, the rounding of the edge shall not be disturbed. All concrete on top of the joint filler shall be completely removed.

All joints shall be tested with a straightedge before the concrete has set, and correction shall be made if one side of the joint is higher than the other or if they are higher or lower than the adjacent slabs.

- (I) Surface Test. The Contractor shall also have a 16' rolling straightedge on the work to check the completed pavement. Surface deviations in excess of 1/4 inch in 16 feet in any direction will require correction by planing. Deviations exceeding 1/2" shall be cause for removal and replacement .

Any area or section so removed shall not be less than 10 feet in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of

pavement, any remaining portion of the slab adjacent to the joints that is less than 10 feet in length shall also be removed and replaced.

- (m) Curing. Immediately after the finishing operations have been completed and marring of the concrete will not occur, the entire surface of the newly placed concrete shall be cured in accordance with one of the following methods. In all cases in which curing requires the use of water, the curing shall have prior right to all water supply or supplies. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than ½ hour between stages of curing or during the curing period.

- 1). Impervious Membrane Method. The entire surface of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall.

Curing compound shall be applied by mechanical sprayers under pressure at the rate of 1 gallon to not more than 125 square feet. The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application the compound shall be stirred continuously by effective mechanical means. Hand spraying of off widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. Curing compound shall not be applied to the inside faces of joints to be sealed.

The curing shall be of such character that the film will harden within 30 minutes after application. Should the film become damaged from any cause within the required curing period, the damaged portions shall be repaired immediately with additional compound.

Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

- 2). Curing in Cold Weather. When the average daily temperature is below 40°F., curing shall consist of covering the newly laid pavement with a protective curing authorized by the Engineer, which shall be retained in place as determined by the Engineer. Admixture for curing or temperature control may be used only when authorized by the Engineer.

When concrete is being placed and the air temperature may be expected to drop below 30°F., a sufficient supply of suitable blanketing material shall be provided along the work. Any time the temperature may be expected to reach the freezing point during the day or night, the material so provided shall be spread over the pavement to prevent freezing of the concrete. The period of time such protection shall be maintained shall be determined by the Engineer. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather, and any concrete injured by frost action shall be removed and replaced at the Contractor's expense.

- (n) Removing Forms. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has set for at least 12 hours, except where auxiliary forms are used temporarily in widened areas. Forms shall be removed carefully to avoid damage to the pavement. After the forms have been removed, the sides of the slab shall be cured as

outlined in one of the methods indicated in paragraph (m) above. Major honeycombed areas shall be considered as defective work and shall be removed and replaced. Any area or section so removed shall be not less than 10 feet in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than 10 feet in length shall also be removed and replaced.

- (o) Sealing Joints. The joints in the pavement shall be sealed in accordance with Section P-605 of these specifications.
- (p) Protection of Pavement. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by his own employees and agents. This shall include watchmen to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, or crossovers, etc.

The plans or special provisions will indicate the location and type of device or facility required to protect the work and provide adequately for traffic. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense.

- (q) Loading on new concrete The pavement shall attain a strength of 450 psi for dowel drilling equipment on the new concrete, 500 psi for paving equipment on the new pavement and 650 psi for opening to air traffic. The strength shall be determined based on the actual strength adjusted for the ratio of the design thickness compared to the actual thickness based on the pavement design.
- (r) Opening to Traffic. The Engineer shall decide when the pavement shall be opened to traffic, based on maturity meter readings and/or flexural strength testing. The pavement shall not be opened to traffic for at least 3 days after the concrete has been placed. Prior to opening, the pavement shall be cleaned.
- (s) Surface Tolerances. Extreme care must be exercised in all phases of the operation to assure that the pavement will pass the specified tolerances. The following tolerances are applicable:
 - 1). Lateral deviation from established alignment of the pavement edge shall not exceed plus or minus 0.10 foot in any lane.
 - 2). Vertical deviation from established grade shall not exceed plus or minus 0.04 foot at any point.
 - 3). Surface smoothness deviations shall not exceed 1/4" from a 16-foot straightedge placed in any direction, including placement along and spanning any pavement joint or edge, and in addition shall not exceed the requirements as stated in 03)(L).
 - 4). In order to stay within the above tolerances, the Contractor must control the tolerances on all phases of construction preceding the placement of pavement and is cautioned that additive deviations may result in the removal and replacement of out of tolerance construction and/or price adjustments for deficient construction in accordance with the specifications as stated herein.
- (t) Tolerance of Pavement Thickness. The thickness of the pavement shall be determined by average caliper measurement of cores taken and tested in accordance with AASHTO T-148 and by edge measurements taken prior to placement of adjacent lanes. Cores shall be taken

by the Contractor at the frequency of one per 250 feet per lane per section to verify pavement thickness and concrete consolidation. The Contractor shall patch the core holes in a manner approved by the Engineer.

Should any portion of the concrete pavement fail to meet the requirements of the thickness, the following shall apply:

- 1). The twenty-eight (28) day strengths for the area of thickness deficiency shall be adjusted in proportion to the square of the thickness.

$$f_{s_{adjusted}} = \frac{t_{actual}^2}{t_{design}^2} \times f_{s_{actual}}$$

Where: t_{actual} = actual pavement thickness

t_{design} = pavement design thickness shown on plans

$f_{s_{actual}}$ = actual 28 day flexural strength

$f_{s_{adjusted}}$ = adjusted 28 day flexural strength

- 2). If $f_{s_{adjusted}}$ is less than 650 psi, the unit price shall be adjusted in accordance with Table III in Article 03(e), Item ii.

04) METHOD OF MEASUREMENT

- (a) The yardage to be paid for shall be the total area of each depth of pavement, measured in square yards, in-place, completed and accepted less any deductions hereinbefore required for deficient strength or thickness. Thickened slabs will be measured separately.
- (b) The quantity of low-slump low-strength fill concrete, to be paid for shall be the total volume measured in cubic yards, in-place, completed and accepted less any deductions hereinbefore required for deficient strength or thickness. Measurements will be made at all locations where the low-slump, low-strength fill concrete is used to cap underdrain and utility trenches in existing stabilized base course and shoulders, as a new base course for pavement widening and base course reconstruction, and for any replacement of untreated subgrade soil. Measurement will not be made for the use of the low-slump low-strength concrete used by the contractor to repair damage to existing base course and subgrade.

05) BASIS OF PAYMENT

- (a) General. The accepted quantities of concrete pavement will be paid for at the contract unit price per square yard, after any adjustments required for deficient strength or thickness, which price and payment shall be full compensation for all mix designs, for furnishing and placing all materials, including any dowels and steel reinforcement.
- (b) No additional payment over the unit contract bid price shall be made for any pavement which has an average thickness in excess of that shown on the plans or for strengths in excess of that specified.
- (c) Adjustments in the payment will be made for smoothness, in accordance with sections 03)(I) i) and ii).

- (d) Payments for low-slump, low-strength fill concrete for base or base replacement shall be paid at the contract unit price per cubic yard which price and payment shall be full compensation for mix design, for furnishing and placing all materials and incidentals. Payment for low-slump, low-strength fill concrete placed in underdrain or duct banks shall be included in the unit price bid for those items.
- (e) Payment will be made under:
- Item P-501-1 Low Slump, Low Strength Fill Concrete - Per Cubic Yard.

TESTING AND MATERIAL REQUIREMENTS

Test and short title

AASHTO T-26 – Water
 AASHTO T-23 – Test Specimens
 AASHTO T-97 – Flexural Strength
 AASHTO T-119 – Slump
 AASHTO T-152 – Air (Aggregate)

 ASTM T-173 – Air (Slag)
 AASHTO T-121 – Yield
 AASHTO T-84 and T-85 –
 Absorption and Specific
 Gravity
 AASHTO T-148 – Cores
 ASTM C1260 – ASR
 ASTM C1293 – ASR

Material and short title

AASHTO M 6 – Fine Aggregate
 AASHTO M 80 – Coarse Aggregate
 AASHTO M 85 – Portland Cement Concrete
 AASHTO M 154 – Air-entrained PC
 AASHTO M 151 – Slag PC
 AASHTO M 90 – Joint Filler
 AASHTO M 153 – Joint Filler
 AASHTO M 213 – Joint Filler
 AASHTO M 55 – Wire
 AASHTO M 137 – Bars
 AASHTO M 54 – Bars
 AASHTO M 31 – Bars
 AASHTO M 42 – Bars
 AASHTO M 73 – Mats
 AASHTO M 139 – Paper
 AASHTO M 171 – Polyethylene
 AASHTO M 182 – Burlap
 AASHTO M 148 – Membrane
 ASTM C94 – Ready-Mixed Concrete
 ASTM C143 – Slump
 ASTM C173 – Air Content

 ASTM C 618 – Fly Ash
 ASTM C109 – Mortar Compressive Strength
 ASTM C157 – Length Change of Mortar and
 Concrete
 ASTM C 402 – Pozzolans
 ASTM C 260 – Air-entraining
 ASTM C 494 – Chemical Admixtures for Concrete
 ASTM C1581 – Restrained Shrinkage Cracking
 AASHTO M 157 – Ready Mix
 ACI 304 Guide for Measuring, Mixing,
 Transporting and Placing Concrete
 ACI 212 Admixtures
 Fed. Spec. TT-C-800 – Membrane

Note: Others as required by referenced specifications.

END OF SECTION P-501

SECTION P-621 - PAVEMENT MARKINGS AND MARKING REMOVAL

01) DESCRIPTION

This section shall consist of the preparation and painting of markings and stripes, installing preformed thermoplastic markings, and the removal of existing markings, on the surface of Runway, Taxiways, Aprons and Roadways applied in accordance with these specifications and at the locations shown on the plans, or as directed by the City.

02) MATERIALS

(a) Materials Acceptance. The Contractor shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers for inspection by the Engineer. Material shall not be loaded into the equipment until inspected by the Engineer.

(b) Paint. Paint shall be Waterborne meeting the requirements of Federal Specification TT-P-1952E, Type II, furnished in White – 37925, Yellow – 33538 or 33655, Red – 31136, and Black – 37038, in accordance with Federal Standard No. 595. The color pink shall be made using one part Red – 31136 to two parts White – 37925.

(c) Preformed Thermoplastic Markings. Markings must be composed of ester modified resins in conjunction with aggregates, pigments, and binders that have been factory produced as a finished product. The material must be impervious to degradation by aviation fuels, motor fuels, and lubricants.

1) The markings must be able to be applied in temperatures down to 35°F without any special storage, preheating, or treatment of the material before application. The markings must be supplied with an integral, non-reflectorized black border.

2) Graded Glass Beads.

(a) The material must contain a minimum of thirty percent (30%) intermixed graded glass beads by weight. The intermixed beads shall conform to Federal Specification. TT-B-1325D, Type IV.

(b) The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of 1 lb. (\pm 10%) per 10 sq. ft. These factory applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

Size Gradation		Retained, %	Passing, %
US Mesh	µm		
12	1700	0 - 2%	98 - 100%
14	1400	0 - 3.5%	96.5 - 100%
16	1180	2 - 25%	75 - 98%
18	1000	28 - 63%	37 - 72%
20	850	63 - 72%	28 - 37%
30	600	67 - 77%	23 - 33%
50	300	89 - 95%	5 - 11%
80	200	97 - 100%	0 - 3%

3) Heating Indicators. The top surface of the material (same side as the factory applied surface beads) shall have regularly spaced indents. These indents shall act as a visual cue during application that the material has reached a molten state so satisfactory adhesion and proper bead embedment has been achieved and a post-application visual cue that the installation procedures have been followed.

4) Pigments. Percent by weight.

(a) White:

Titanium Dioxide, ASTM D 476, type II shall be 10 percent minimum.

(b) Yellow and Colors:

Titanium Dioxide, ASTM D 476, type II shall be 1 percent minimum.

Organic yellow, other colors, and tinting as required to meet color standard

5) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

6) Daylight Directional Reflectance.

(a) White: The daylight directional reflectance of the white paint shall not be less than 75 percent (relative to magnesium oxide), when tested in accordance with Federal Test Method Standard No. 141D/GEN, Method 6121.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 45 percent (relative to magnesium oxide), when tested in accordance with Federal Test Method Standard No. 141D/GEN. The x and y values shall be consistent with the Federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

7) Skid Resistance. The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

- 8) **Thickness.** The material must be supplied at a nominal thickness of 65 mils (1.7 mm).
- 9) **Environmental Resistance.** The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to aviation fuels, gasoline, and oil.
- 10) **Retroreflectivity.** The material, when applied in accordance with manufacturer's guidelines, must demonstrate a uniform level of nighttime retroreflection when tested in accordance to ASTM E1710.
- 11) **Packaging.** A protective film around the box must be applied in order to protect the material from rain or premature aging.
- 12) **Manufacturing Control and ISO Certification.** The manufacturer must be ISO 9001:2000 certified and provide proof of current certification. The scope of the certification shall include manufacture of reflective markings.
- (a) The markings must be a resilient thermoplastic product with uniformly distributed glass beads throughout the entire cross-sectional area. The markings must be resistant to the detrimental effects of aviation fuels, motor fuels and lubricants, hydraulic fluids, de-icers, anti-icers, protective coatings, etc. Lines, legends, and symbols must be capable of being affixed to bituminous and/or Portland cement concrete pavements by the use of a large radiant heater. Colors shall be available as required.
 - (b) The markings must be capable of conforming to pavement contours, breaks, and faults through the action of airport traffic at normal pavement temperatures. The markings must be capable of fully conforming to grooved pavements, including pavement grooving per FAA AC 150/5320-12, current version. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastics when heated with a heat source per manufacturer's recommendation.
 - (c) Multicolored markings must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each large marking segment (typically more than 20 ft. long) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a marking segment. Obtaining multicolored effect by overlaying materials of different colors is not acceptable due to resulting inconsistent marking thickness and inconsistent application temperature in the marking/substrate interface.
 - (d) The marking material must set up rapidly, permitting the access route to be re-opened to traffic a maximum of 15 minutes after application.
 - (e) The marking material shall have an integral color throughout the thickness of the marking material.
- (d) **Reflective Media.** This feature will be provided by the addition of glass spheres to the surface of the pigmented binder. Glass spheres shall meet the requirements of Federal Specification TT-B-1325D, Type III. Glass beads shall be treated with all compatible

coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

- (e) Water. Water to be used by high-pressure water equipment for removing pavement markings shall be obtained by the Contractor from a potable source.
- (f) Chemicals. The use of chemicals for removing pavement markings will not be permitted.

03) CONSTRUCTION METHODS

- (a) Weather Limitations. The painting shall be performed only when the existing surface is dry and clean, when the atmospheric temperature is at least 45°F and rising, when the pavement surface temperature is at least 5°F above the dew point, and when the weather is not excessively windy, dusty, or foggy. The suitability of the weather will be determined by the City.

Do not perform work when the atmospheric temperature is below 40 degrees F or when the pavement is covered with snow or ice.

Markings shall not be applied when the wind speed exceeds 10 knots unless windscreens are used to shroud the material guns.

- (b) Equipment. All equipment for the work shall be approved by the City and shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.
 - 1) The mechanical marker shall be an approved atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross sections and clear-cut edges without running or spattering and within the limits for straightness set forth herein. When needed, a dispenser shall be furnished which is properly designed for attachment to the mechanical marker and suitable for dispensing the required quantity of reflective media. The equipment shall be capable of applying markings from 6 to 36 inches in a single pass with uniform coverage and capable of applying two colors simultaneously without applying glass beads to the black markings.
 - 2) Suitable adjustments shall be provided on the sprayer(s) of a single machine or by furnishing additional equipment for painting the width required.
- (c) Removal Methods. Pavement markings shall be removed from indicated areas by methods acceptable to the Engineer, such as sandblasting, waterblasting, or beadblasting, that cause negligible damage to existing pavements, surface texture, joint sealants, or other airfield appurtenances as determined by the City. The method for protecting existing joint sealants during marking removal shall be submitted to the Engineer for approval prior to beginning work on this item. The Contractor shall repair at his expense any damage to the pavement, surface texture, sealant, or appurtenances caused by the removal work. Methods to repair damages shall be acceptable to the City.
 - 1) Contractor shall be aware that existing paint to be removed may contain lead. Safety precautions shall be taken for environmental concerns. Contractor shall test the area prior to submitting a bid for this condition.

- 2) Any removal method that causes objectionable dust, contaminated water runoff, or other such hazard or nuisance shall be controlled by means approved by the City that eliminate such causes of objection or its use will not be allowed.
- (d) Preparation of Surfaces. Immediately before application of the paint, the existing surface shall be dry and entirely free from dirt, grease, oil, acids, laitance, existing paint, or other foreign matter which would reduce the bond between the coat of paint and the pavement. The surface shall be thoroughly cleaned by waterblasting as required to remove all dirt, laitance and loose materials. After the cleaning operations, vacuuming or other City-approved cleaning methods shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.
- 1) During blasting, dust and debris will be controlled and contained by vacuums or other approved processes.
 - 2) Obliterating pavement markings by masking with paint, bituminous material, surface treatments or other cover material will not be an acceptable removal method.
 - 3) Paint shall not be applied to new Portland cement concrete pavement until the concrete in the areas to be painted is clean of curing material and/or removal of existing markings. Sandblasting or high pressure water shall be used to remove curing material and laitance from the concrete surfaces.
- (e) Layouts and Alignment. Suitable layouts and lines of proposed stripes shall be spotted in advance of the paint application. Control points shall be spaced at such intervals as will insure accurate location of all markings. All stripes shall be accurately surveyed and layout accomplished well in advance of painting and shall be approved by the City prior to applying paint.
- 1) The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions and application of the paint.
- (f) Application. Markings shall be applied at the locations and to the dimensions and spacing indicated on the plans or as specified. Paint shall not be applied until the layouts, indicated alignment and the condition of the existing surface have been approved by the City. Pavement shall be dry to the satisfaction of the City prior to application of paint.
- 1) The paint shall be mixed in accordance with the manufacturer's instructions before application. The paint shall be thoroughly mixed and applied to the surface of the pavement with the marking machine at its original consistency without the addition of thinner. The paint shall be applied uniformly by suitable equipment at the following rates:

Pavement Type

Portland Cement Concrete
Freshly Sealcoated Asphalt Concrete
Other Asphalt Concrete

Paint Application Rate

115 Square Feet per Gallon
75 Square Feet per Gallon
115 Square Feet per Gallon

- 2) The reflective media shall be distributed to the surface of the pigmented binder immediately after application and imbedded at the rate and depth as required to provide adhesion and reflection. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Type III glass beads shall be applied at the rate of 10 pounds per gallon of paint for white and yellow markings. Type III glass beads shall not be used for red pink, or black markings.

Red and pink markings shall utilize Type I, gradation A glass beads. Type I, gradation A glass beads shall be applied at the rate of 5 pounds per gallon of paint for red or pink markings.

- 3) All painting shall be performed to the satisfaction of the City by competent and experienced equipment operators, laborers, and artisans in a neat and workmanlike manner. The edges of the markings shall not deviate from a straight line more than $\frac{1}{2}$ in 50 feet and marking dimensions and spacings shall be within the following tolerances

Dimension and Spacing	Tolerance
36 inches	+/- $\frac{1}{2}$ inch
Greater than 36 inches to 6 feet	+/- 1 inch
Greater than 6 feet to 60 feet	+/- 2 inches
Greater than 60 feet	+/- 3 inches

- 4) A period of 7 days shall elapse between placement of a bituminous surface course or seal coat and application of the paint. Upon application to properly prepared surfaces after curing, the paint shall not bleed excessively, blister, peel, curl, or discolor.
- 5) New concrete pavement shall be allowed to cure for 7 days before removing curing compound and installing permanent markings. Temporary markings shall be applied at a 50% application rate. Glass beads shall not be required for temporary markings.
- 6) The Contractor shall furnish certified test reports for the materials shipped to the project. These reports shall not be interpreted as a basis for final acceptance. The City shall be notified upon arrival of a shipment of paint to the job site for inspecting and sampling of the materials. The Contractor shall make an accurate accounting of the paint materials used in the accepted work. All emptied containers shall be returned to the storage area for checking by the Engineer. The containers shall not be removed from the airport or destroyed until authorized by the Engineer.
- (g) Protection. After application of the paint, all markings shall be protected while the paint is drying. The fresh paint shall be protected from injury or damage of any kind. The Contractor shall be directly responsible and shall erect or place suitable warning signs, flags or barricades, and protective screens or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage, drippings of paint or other materials. Contractor's failure to protect fresh paint shall result in repainting at contractor's expense.
- (h) Cleanup. The Contractor shall remove from the site all debris, waste, and by-products generated by the surface preparation and application operations to the satisfaction of the Engineer. Loose or unadhered reflective media shall be removed from the site to the

satisfaction of the Engineer. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and Federal environmental statutes and regulations.

- (i) Defective Workmanship or Material. When any material not conforming to the requirements of the specifications or plans has been delivered to the project or incorporated in the work, or any work performed is of inferior quality, such material or work shall be considered defective and shall be corrected as directed by the City, at the expense of the Contractor. Any area of paint that chips or peels or wears excessively in respect to the overall work shall be repainted within the warranty period. Any areas that do not have a continuous uniform coverage of beads will need to be remarked at the Contractor's expense.

- (j) Application of Preformed Thermoplastic Markings
Preformed thermoplastic markings shall be installed by a manufacturer's certified applicator. Installation shall be performed in accordance with the manufacturer's recommendations.

To ensure minimum single-pass application time and optimum bond in the marking/substrate interface, the materials must be applied using a variable speed self-propelled mobile heater with an effective heating width of no less than 16 feet (4.88 m) and a free span between supporting wheels of no less than 18 feet (5.49 m). The heater must emit thermal radiation to the marking material in such a manner that the difference in temperature of 2 inch (5.08 cm) wide linear segments in the direction of heater travel must be within 5 percent of the overall average temperature of the heated thermoplastic material as it exits the heater. The material must be able to be applied at ambient and pavement temperatures down to 35°F (2°C) without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry, and free of debris. A non-VOC sealer with a maximum applied viscosity of 250 centi-Poise (ASTM D 2393) must be applied to the pavement shortly before the markings are applied. The supplier must enclose application instructions with each box/package.

04) METHOD OF MEASUREMENT

- (a) The payment for pavement striping and marking removal shall be the number of square feet of paint removed.
- (b) The quantity of pavement striping and marking, shall be paid by the number of square feet of paint applied in accordance with the specifications and accepted by the City.
- (c) ***The quantity of temporary pavement marking and marking removal, shall be paid by the number of square feet of paint applied in accordance with the specifications and accepted by the City. This price shall include removal of temporary markings.***

05) BASIS OF PAYMENT

- (a) Payment shall be made at the Contract unit price per square foot for striping or marking removal. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete the item.
- (b) Payment shall be made at the Contract unit price per square foot for pavement striping, and marking, including the surface prep prior to paint application, paint and the reflective media. This price shall be full compensation for furnishing all materials and for all labor,

equipment, tools and incidentals necessary to complete the item.

- (c) ***Payment shall be made at the Contract unit price per square foot for temporary pavement marking and marking removal including the surface prep prior to paint application, paint and the reflective media. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete the item.***

- (d) Payment will be made under:

Item P-621-1 Pavement Striping and Marking – Per Square Foot.

Item P-621-2 Pavement Striping and Marking Removal – Per Square Foot.

Item P-621-3 Temporary Pavement Marking and Marking Removal – Per Square Foot.

TESTING AND MATERIAL REQUIREMENTS

Test and short title	Material and short title
TT-B-1325C ₁	Beads (Glass Spheres) Retro-reflective
TT-P-1952E ₁	Paint, Traffic and Airfield Marking, Waterborne
Federal STD 595	Colors used in Government Procurement

END OF SECTION P-621

SECTION D-705

PIPE FOR UNDERDRAINS

01) DESCRIPTION

- (a) This item shall consist of pipe for underdrains of the type, classes, sizes, and dimensions required on the plans, furnished and installed at the places designated on the plans, or by the Engineer, in accordance with these specifications and with the lines and grades given.
- (b) This item shall include the furnishing and installation of underdrain pipe in place, the cost of underdrain pipes, common excavation, pavement removal, furnishing and installing all trench bracings, all fittings required to complete the underdrains as shown on the plans, and the material for the making of all joints including all connections to existing drainage pipes and structures.
- (c) The bid price per linear foot of pipe shall include all backfill made with earth excavated from the immediate trench. Granular backfill, conforming to the requirements of Section 806, Aggregate for Drainage, of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, shall meet the following specifications.

02) MATERIALS

- (a) Underdrain Backfill. Underdrain backfill shall meet the quality requirements of Section 800, Coarse Aggregate, with the gradation meeting the requirements of size 89.

The above material shall be used to replace material from the trench for perforated pipe and shall be paid for separately as specified herein. Gradations shall be obtained on samples of underdrain backfill prior to delivery to the job site. Additional gradations shall be obtained at the rate of one (1) per week for size No. 89 during the stockpiling and placement operations. The quality requirement tests described under section 800 shall be performed prior to the start of delivery to the job site.

- (b) General. Materials shall meet the requirements shown on the plans and as specified below.
 - 1) Smooth-wall Perforated PVC Pipe, ASTM F758, Poly (vinyl chloride) Ribbed Drain Pipe & Fittings, based on controlled inside diameter, ASTM F794, Poly (vinyl chloride) (PVC) corrugated sewer pipe with a smooth interior and fittings, ASTM F949, Poly (vinyl chloride) (PVC) Profile Drain Pipe and fittings based on controlled inside diameter AASHTO M30. All PVC pipe for under drains shall be Schedule 40
 - 2) Fittings are not required to be leak-proof but must be tight enough to prevent intrusion of fine material. Fittings may snap or screw on. All fittings shall be of the composition and have the same physical properties as the tubing and shall not restrict flow. Fittings as a continuous part of the line shall be capable of passing the stretch resistance test in accordance with ASTM F-405, latest revision.

Schedule 40 PVC pipe supplied as meeting this specification shall be marked with the manufacturer's identification symbol regularly at not more than 10 ft. intervals and in addition may be required to carry an approved symbol designating the manufacturer's assurance of compliance also at regular intervals along the pipe. Fittings shall bear the identification symbol of the manufacturer. Each bundle shall bear the date, month and

year of manufacture.

- 3) All underdrain pipe backfill shall be AASHTO or ASTM No. 89 stone.

03) CONSTRUCTION METHODS

- (a) Equipment. All equipment necessary and required for the proper construction of pipe underdrains shall be on the project, in first class working condition, and approved by the Engineer before construction is permitted to start. The equipment shall be able to be set up to maintain line and grade control accurately without damaging the existing soil cement base. A standard backhoe will not be approved for this work

- 1) The Contractor shall provide hand tampers and pneumatic tampers to obtain the required compaction of the pipe bed and backfill, as specified.

- (b) Excavation. The Contractor shall do all necessary excavation to the depth shown on the plans.

- 1) Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the Engineer. The excavation shall not be carried below the required depth; when this is done, the trench shall be backfilled at the Contractor's expense with material approved by the Engineer and compacted to the density of the surrounding earth material as determined by the AASHTO Compaction Control Tests AASHTO T-180. The laboratory compaction and field density shall be determined by methods described in Section P-152, "Excavation and Embankment".
- 2) In case the depth of cut is changed from that shown on the plans, the change shall not exceed 6" without a revision in the contract unit price per linear foot of pipe. However, if the depth of cut is changed more than 6", compensation or deduction of work involved, whether increased or decreased, shall be provided for in a supplemental agreement.
- 3) The minimum width of the trench at the top of the pipe, when placed, shall be a width which will permit the proper construction of joints and compaction of backfill around the pipe.
- 4) The Contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. Unless otherwise provided, the bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the backfill to at least 12" over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot for the pipe.
- 5) The Contractor is cautioned to exercise extreme care, particularly in the areas immediately and adjacent to taxiway and runway edges, where lighting conduit runs continuously and under which the piping must pass. The Contractor is further cautioned to exercise care in the vicinity of FAA communication, power, and electronic circuits. Damages to these and any other underground utilities shall be repaired in accordance with "General Conditions, Section 22.11". All cost associated with these repairs shall be paid for by the Contractor.

- (c) Laying and Installing Pipe.

- 1) The Contractor's facilities for lowering the pipe into the trench shall be such that neither the pipe nor the trench will be damaged or disturbed.
 - 2) The Engineer shall inspect all pipe before it is laid, and reject any section that is damaged by handling or is defective to a degree which will materially affect the function and service of the pipe.
 - 3) The laying of the pipe in the finished trench shall be started at the lowest point and laid upgrade. The pipe shall be firmly and accurately set to line and grade so that the invert will be smooth and uniform. Pipe shall not be laid on frozen ground or in a wet trench.
 - 4) PVC pipe shall be installed in accordance with the requirements of ASTM D2321 or AASHTO standard specifications for Highway Bridges Section 30. Perforations shall meet the requirements of AASHTO M252 or M294 class 2, unless otherwise indicated on the plans.
- (d) Mortar. The mortar shall be of the desired consistency for making connections to other pipes or to structures. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted.
- (e) Backfilling.
- 1) Earth. All trenches and excavations shall be backfilled within a reasonable time after the pipes are installed, unless other protection of the pipe is provided. Backfill material shall be approved by the Engineer. Special care shall be taken in placing the backfill. Great care shall be used to obtain thorough compaction under the haunches and along the sides to the top of the pipe.
 - i) The backfill shall be placed in loose layers not exceeding 6" in depth under and around the pipe, and not exceeding 8" over the pipe. Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the Engineer, until the trench is completely filled and brought to the proper elevation. Backfilling shall be done in a manner to avoid injurious top or side pressures on the pipe.
 - ii) In embankments and for other areas, the backfill shall be compacted to 90% of the maximum density as determined by AASHTO T-180. The laboratory compaction and field density shall be determined by methods described in SECTION P-152, EXCAVATION AND EMBANKMENT. Density tests shall be taken at a frequency of one (1) per every other lift per 100 linear feet of trench for earth backfill.
 - 2) Granular Material. When granular backfill is required, its placement in the trench and about the pipe shall be as shown on the plans. Special care shall be taken in placing the backfill. The granular backfill shall not contain a damaging amount of foreign matter, nor shall earth from the sides of the trench or from the windrow be allowed to filter into the backfill. The backfill shall be placed in loose layers not exceeding 6" in depth and compacted by hand and vibratory tampers to the requirements as given above. Backfilling shall be done in a manner to avoid injurious top or side pressure on the pipe. The granular backfill shall be made to the elevation of the trench, as shown on the plans.

- i) When perforated pipe is specified, granular backfill material shall be placed along the full length of the pipe. The position of the granular material shall be as shown on the plans.
- ii) Whenever a granular subbase blanket course is to be used under pavements or which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of 2" above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material which remains over the underdrain trench shall be removed and replaced.

The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench. The backfill shall be compacted in accordance with the applicable portions of Section D-701 Pipe for Storm Drains.

- (f) Connections. When the plans call for connections to existing or proposed structures, these connections shall be watertight and made so that a smooth uniform flow line will be obtained throughout the drainage system.
- (g) Flushing and/or Rodding. The flushing and/or rodding of underdrain pipe shall be accomplished in such a manner to reasonably assure that the underdrain longitudinal pipes and outlet pipes are not obstructed or blocked or discontinuous.

Sufficient water is to be injected into the system, overcoming the amount absorbed into the backfill aggregate, to reasonably indicate free flow. This can be observed by monitoring the time it takes to reach a monitoring point and the magnitude of flow. The reverse also will be monitored; i.e. the time it takes for the flow to abate.

If the lines appear to be blocked, obstructed, or discontinuous, based on the above monitoring, the Contractor is to rod the lines to determine the point of the problem.

An exploratory pit would then be dug at the perceived problem point and corrections made to the underdrains.

- (h) Cleaning and Restoration of Site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as ordered by the Engineer. Except for paved areas of the Airport, the Contractor shall restore all disturbed areas to their original condition.
 - 1) After all work is completed, the Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.
 - 2) Performance of the work described in this section is not payable directly but shall be considered as a subsidiary obligation of the Contractor, covered under the contract unit price for the underdrain.

04) METHODS OF MEASUREMENT

- A. The length of pipe to be paid for shall be the number of linear feet of underdrain pipes in place, completed, and approved to be measured along the centerline of the pipe from end of pipe or inside face of structure to the end or inside face of structure, whichever is applicable. All fittings and appurtenances shall be included in the length as typical pipe sections in the pipe being measured.
- B. Underdrain cleanouts constructed and finished in-place will each be counted for payment.
- C. Trench Rock Excavation will be measured per specification P-152.

05) BASIS OF PAYMENT

- A. Payment will be made at the contract unit price per linear foot for each kind of pipe, type and size designated. These prices shall be full compensation for furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete these items, including the excavation and removal of existing underdrain pipes, connections to existing drainage pipes and structures and drainage stone. The cost of underdrain outfall pipe, concrete encasement, concrete collars at manholes or inlets, shall also be included in the linear foot price bid for the non-perforated outlet underdrain outlet pipe.
- B. Payment for underdrain cleanouts shall be made for each cleanout installed and accepted in-place. These prices shall be full compensation for furnishing all materials, including joint sealant, and for all labor, equipment, tools and incidentals necessary to complete these items.
- C. Payment for underdrain outlets shall be made for each outlet installed and accepted in-place. These prices shall be full compensation for furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete these items.
- D. Payment for the underdrain pipe aggregate backfill shall be made per cubic yard placed and accepted.
- E. Payment for Trench Rock Excavation, if required, will be per item P-152.

Payment will be made under:

- Item D-705-1 8" Perforated PVC Pipe – Per Linear Foot
- Item D-705-2 6" Perforated PVC Pipe – Per Linear Foot
- Item D-705-3 Coarse Aggregate Backfill, #89 Stone– Per Cubic Yard
- Item D-705-4 Underdrain Cleanout – Per Each**
- Item D-705-5 8" Non-Perforated Underdrain Outlet Pipe, Concrete Encased – Per Linear Foot**

TESTING AND MATERIAL REQUIREMENTS

Test and short title	Material and short title
AASHTO T-180 – Density	AASHTO M-85--Portland Cement
AASHTO T-27 – Gradation	AASHTO M-45--Sand
	ASTM C-6--Hydrated Lime

ASTM D-1248--Joints
ASTM D-3034--PVC Pipe & Fittings
ASTM F-758--PVC Pipe
ASTM F-949--PVC Pipe

END OF SECTION D-705

SECTION F-162 CHAIN LINK FENCES

01) DESCRIPTION

- (a) This item shall consist of furnishing and erecting chain link fences and gates for security and other purposes. Fences covered in this section shall be polyvinyl chloride (PVC) coated chain link fences constructed on the ground as indicated on the plans. All fences shall be in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer.
- (b) The fence shall be the product of a manufacturer who has demonstrated by actual installations of a similar nature that its products are of the type required. The Contractor shall include all supplementary parts necessary or required for a complete and satisfactory installation within the true meaning and intent of the drawings. All runs of the fence shall present the same general appearance and the product of one manufacturer only will be accepted, except for items which do not influence the appearance of the completed fence. Except as otherwise specified, no used, rolled or open-seam steel shall be permitted in posts, gate frames, rails, or braces.
- (c) Concrete Barrier, if specified on the plans, shall include appurtenant materials and work in making connections to other structures or guard rails as may be required to complete the construction indicated on the plans.
- (d) This item shall include removal of chain link fences, galvanized or vinyl-clad, at locations specified or as directed by the Engineer. Fences to be removed are constructed on-grade, not on concrete barrier walls.

02) MATERIALS

- (a) Fabric. The fabric shall be woven with a 9-gauge polyvinyl chloride (PVC)-coated galvanized steel wire in a 2" mesh and shall meet the requirements of ASTM A 392, Class II and ASTM F-668, class 2b. Coating color shall be black.
- (b) Barbed Wire. Barbed wire shall be 2-strand 12-1/2 gauge zinc coated wire with 4-point barbs and shall conform to the requirements of ASTM A121, Class 3, Chain Link Fence Grade. The barbs shall be spaced approximately 4" apart. The wire shall be PVC coated.
- (c) Posts, Rails and Braces. Posts, rails, and braces shall be PVC coated galvanized steel pipe conforming to the requirements of ASTM F1043 and ASTM F1083 as follows:
 - 1) Galvanized tubular steel pipe shall conform to the requirements of Group 1A (Schedule 40), coatings conforming to Type A.

Vinyl coated steel shall conform to the requirements of ASTM F1043, Paragraph 7.3 Optional Supplemental Color Coating.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Federal Specification RR-F-191/3.

- (d) Gates. Gate frames shall consist of PVC coated galvanized steel pipe and shall conform to the specifications for the same material under paragraph 02 c) above. The fabric shall be of the same type material as used in the fence. Swing gates shall meet the

requirements of ASTM F 900. Truss rods are required on all swing gate panels 5 feet wide or wider. Horizontal slide gates shall meet the requirements of ASTM F 1184. Unless specified otherwise, all SIDA gates shall be fabricated to accommodate intelligent key system locks.

- (e) Wire Ties and Tension Wires. Wire ties and tension wire for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type.
 - 1) The tension wire shall be 7-gauge marcelled steel conforming to ASTM A824.
 - 2) Wire fabric ties shall be galvanized steel wire of not less than 9-gauge. Aluminum ties are not acceptable.
 - 3) All material shall conform to Federal Specification RR-F-191/4.
- (f) Miscellaneous Fittings and Hardware. Miscellaneous steel fittings and hardware for use with galvanized steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric, posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with zinc coating applied in conformance with ASTM A 153 and shall be PVC coated. Barbed wire support arms shall withstand a load of 250 pounds applied vertically to the outermost end of the arm.
- (g) Marking. Each roll of fabric shall carry a tag showing the kind of base metal, kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal, and kind of coating.
- (h) Concrete. Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 3,000 psi.
- (i) Concrete Barrier. Conform to Article 621.02 of Georgia DOT Standard Specifications
- (j) Gate Locks. Locks shall be Mul-T-Lock Model C-13, Pop Shackle Padlock, with ½" diameter, 1.456" height shackle, or approved equal. Locks shall be manufactured to open only with Department of Aviation, Security keys. Gate numbers shall be imprinted on locks.
- (k) Gate Chains. Gate chains shall be 3/8", grade 30 steel. Chain shall be of sufficient length to secure gate leaf to adjacent leaf or gate post.

03) CONSTRUCTION METHODS

- (a) General. The fence shall be constructed in accordance with the details on the plans and as specified herein using new materials and all work shall be performed in a workmanlike manner satisfactory to the Engineer. Prior to the beginning of the work, the Contractor shall locate the position of the work establishing and marking the property line or fence line.

When directed, the Contractor shall span the opening below the fence with barbed wire fastened to stakes of the required length at locations of small natural or drainage ditches

where it is not practical to conform the fence to the general contour of the ground surface. Unless otherwise directed by the Engineer, drainage blockouts shall be located every 200 feet along concrete barrier walls.

The new fence shall be permanently tied to the terminals of existing fences whenever required by the Engineer. The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail. When directed, the Contractor shall be required to stake down the chain link fence at several points between posts.

- 1) The Contractor shall arrange the work so that the security of the airport is maintained at all times. The Contractor shall provide temporary fencing, to protect the security of the airport. No separate payment shall be made for temporary fencing required by his operations. Openings in the fence shall be guarded. A breach in the security fence shall not be allowed to remain unprotected.
 - 2) Removal of chain-link fences shall consist of entire removal of the items and appurtenances, including rails, fabric, barbed wire, gates, posts, anchors, incidentals, and disposal of all materials.
 - 3) Care shall be exercised in the removal of the existing fence and its appurtenances. Should the Contractor damage any existing material to remain through negligence or carelessness, he shall replace the damaged material at no cost to the City.
 - 4) The Contractor shall dispose of removed fence material off airport property at no cost to the City.
- (b) Clearing Fence Line. The site of the fence shall be sufficiently cleared of obstructions, and surface irregularities shall be graded so that the fence will conform to the general contour of the ground. Selective grading will be required to provide a neat appearance when directed by the engineer. The fence line shall be cleared to a minimum width of 2 feet on each side of the centerline of the fence. This clearing shall consist of the removal of all stumps, brush, rocks, trees or other obstructions, which will interfere with proper construction of the same fence. Stumps within the cleared area of the fence line shall be grubbed or excavated. The bottom of the fence shall be placed a uniform distance above the ground, as specified on the plans. When shown on the plans or as directed by the Engineer, the existing fences that coincide with, or are in a position to interfere with, the new fence location shall be removed by the Contractor as a part of the construction work, unless such removal is listed as a separate item in bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other material acceptable to the Engineer and shall be compacted properly with tampers.
- The work shall include handling and disposal of all materials cleared, excavated, or removed, regardless of the type, character, composition or condition of such material encountered.
- (c) Installing Posts. All posts shall be spaced not more than 10 feet apart as shown on the plans. Terminal (end, corner, pull and brace) and gate posts shall be set 36" in concrete bases as shown on the plans. The post holes shall be in proper alignment so that there is a minimum of 3 inches of concrete on all sides of the post. The top of the concrete bases

shall be slightly above the ground, trowel finished and sloped to drain away from the posts. Holes of full depth and size for the concrete bases for posts shall be dug to the size and depth as shown on the plans. Blasting of rock or other obstructions shall be done if necessary. No extra compensation shall be made for rock excavation. Rock excavation shall not be grounds for extension of time.

- 1) All post settings shall be done carefully so that all posts shall be vertical and in true alignment and rigidly secured in position. Temporary fence posts shall be firmly set in the ground; however, no concrete shall be required for temporary posts.
 - 2) Additional posts may be required at abrupt changes in grade. All surplus excavated material shall be disposed of as the Engineer directs, but none shall be placed under the fence. The entire hole around each post shall be filled with 3,000 psi concrete. Hand mixing, by methods approved by the Engineer, will be permitted where small quantities are to be mixed. No batch mixed by hand methods shall be larger than 1/2 cubic yard.
 - 3) Posts shall be set vertically in the concrete to the proper depth and firmly braced. When the distance between corner or gate posts exceeds 500 feet on a straight line or 250 feet on a curved line, pull posts braced in two directions shall be set.
 - 4) The Contractor shall be required to do all clearing and select grading required to construct a fence with good alignment.
 - 5) Posts placed on concrete walls or slabs shall be set in round holes, each hole having minimum diameter of 4-1/2" and a minimum depth of 2'. The space around each post shall be filled with a quick setting, non-shrinking, non-corrosive cement filler or grout approved by the Engineer. Water shall not be allowed to accumulate in the holes before they are filled.
 - 6) On terminal (end, corner, pull and brace) and gate posts, the post tops and brace rail clamps around the posts shall be placed before setting the posts in concrete bases. In setting the gate posts, great care must be taken to make sure that gate posts are set the exact distance apart as shown on the plans. For example, posts for a 6 foot gate must be set so as to leave an opening exactly 6 feet wide. A line drawn across from the top of one gate post to the other must be level, regardless of the grade at the ground line.
 - 7) If the ground is not level, the upgrade gate post shall be set first to get the proper height for the downgrade post. The concrete bases for end, corner, pull, brace and gate posts shall be placed first and allowed to cure for 14 days. The concrete bases for line posts shall be allowed to cure for 7 days. Stretcher bar band and truss bands as specified on the plans shall be spread and slipped on end, corner, pull, brace and gate posts as the next operation. Post tops shall then be inserted on all other posts.
- (d) Installing Braces. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed between all terminal (end, corner, pull, and gate) posts and brace posts as shown on the plans.

- (e) Installing Top Rails. To start the installation, a length of top rail shall be run through the first couple of post tops; a rail clamp shall be assembled on the end, corner, or gate post, as the case may be. The end of the rail already placed shall be butted into the clamp and fastened. The top rail shall be installed along the run of the fence and the various sections joined with sleeve couplings. At not more than every 100 feet an expansion coupling shall be placed to take care of expansion and contraction of the rail. The rail shall be clamped in the end, corner, or gate post at the end of the run of the installation of top rail.
- (f) Installing Fabric. The fabric shall be unrolled on the outside of the fence line with the bottom edge of the fabric against the posts. The various rolls shall be spliced by bringing the ends closed together and weaving in a picket in such a way that it will engage both of the roll ends and catch with each twist each separate mesh of the end pickets of both rolls of fabric. The fabric shall be raised and tied loosely to the top rail with a temporary tie wire at intervals of about 20 feet. The fabric shall be installed by a method approved by the Engineer. One method is given below.
- 1) At end, corner, or gate posts, the stretcher bar shall be slipped through the end picket of the fabric and the stretcher bar bands at the same time. Then the bolts in the stretcher bar bands shall be tightened. Additional rolls of fabric shall be spliced and placed as the erection progresses along the fence.
 - 2) In long sections, the fence shall be stretched at intervals of about 100 feet. After the stretching is complete, the fabric shall be tied to the top rails with No. 6 gauge galvanized wire ties security clinched at the back of the rail. The fastenings shall be spaced not more than 24" on centers for the top rail.
 - 3) The fabric shall be attached to the line posts with No. 6 gauge galvanized wire ties securely clinched to the back of the line posts. The fastenings shall be spaced not more than 14" on centers for line posts. The topmost wire tie shall be placed on the line post as near the top of the fabric as possible and the lowest wire tie as near the bottom of the fence as possible.
 - 4) At terminal (end, corner, and pull) and gate posts the fabric shall be fastened with stretcher bars and bands. The fastenings shall be spaced not more than 14" on centers for terminal (end, corner, and pull) and gate posts. The topmost band shall be placed on these posts as near the top of the fabric as possible and the lowest band as near the bottom of the fabric as possible.
 - 5)
 - i. Standard chain link fence stretching equipment shall be provided for stretching the fabric before tying it to the rails and posts. The stretching and tying operations shall be repeated about every 100 feet until the run of fence is completed. Equipment of one type for performing the stretching operation may be composed of four pieces of lumber (2 x 4's or larger) cut into a slightly shorter length than the width of the fabric. The pieces shall be bored for six bolts of about 1/2" or 5/8" diameter and shall be assembled as shown on the plans. One pair shall be used for stretching the fabric and both pairs shall be used for making a closure of a run of the fence.
 - ii. Before making a closure, the other end of the run shall be fastened to the end, corner, or gate post as described previously. The operation of making a closure of a run shall be as follows: The stretching

equipment as described above shall be clamped on the ends of the fabric parallel to each other and about 5 feet apart when the tension is first applied. The stretching shall continue until the slack has been removed from both sections of the fabric. Where the ends overlap, the fabric shall be cut to match. The ends shall be joined by the insertion of a picket similar to the method of connecting two rolls of fabric.

- (g) Installing Gates. Gates shall be hung on gate fittings. The lower hinge (ball and socket type) shall be placed on top of the concrete footing in which the gate post is set; the concrete in the footing shall extend up to the bottom of the lower hinge. The sockets for the cane or foot bolts shall be set in concrete so that the plunger pin will fit perfectly in the socket when the gate is in a closed position. Gates shall be erected to swing in the direction indicated and shall be provided with gate stops as specified or as shown on the plans. All hardware shall be thoroughly secured, properly adjusted, and left in perfect working order. Hinges and diagonal bracing in gates shall be adjusted so that the gates will hang level. Gates shall be secured with pop-shackle padlocks and chains.

- (h) Existing Fence Connections. Wherever the new fence joins an existing fence, whether at a corner or at the intersection of straight fence lines, a corner post with a brace post shall be set at the junction and braced the same as herein described for corner posts or as shown on the plans.

If the connection is made at other than the corner of the new fence, the last span of the old fence shall contain a brace span.

- (i) Electrical Grounds. Electrical grounds shall be constructed at 500 foot intervals along the new fence and at gates as follows:

1) Grounding of metal gates:

- i. Each gate post shall be grounded with #6 A.W.G. BSDC conductor to a separate driven 10 foot long 3/4 inch diameter copper clad ground rod driven so top is a minimum of 1 foot below finished grade. Conductor shall be attached to gate post and ground rod by exothermic welds.
- ii. Each leaf of metal gate should have braided flexible copper strap (O.S. Mfg. Co., No. FB-100-05-1 or approved equal) bolted to gate leaf and to gate post with "U" bolt type grounding clamps.

2) Grounding of metal fences:

- i. For fences with wood or metallic posts set in concrete, the fence shall be grounded with #6 A.W.G. BSDC conductor to a separate driven 10 foot long 3/4 inch diameter copper clad ground rod driven so top is a minimum of 1 foot below finished grade. Conductor shall be attached to fence fabric and barbed wire with split bolt connectors. Connections to ground rods shall be by exothermic welds.
- ii. One 10 foot long 3/4 inch diameter copper clad ground rod is required for each 500 linear feet of fence, or fraction thereof. Sections of fence, regardless of length, isolated by gates, gaps at

splices, or plastic connectors, shall be grounded independently. Conductor shall be attached to fence fabric and barbed wire, with split bolt connectors. Connections to ground rods shall be by exothermic welds.

iii. No grounding is required for fences with driven metal posts when the fence wire is in metallic contact with post.

iv. Grounding of fence where only extension arms are being added will be required.

3) Installation of ground rods shall not constitute a pay item and shall be considered incidental to the fence construction.

(j) Cleaning Up. The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction.

(k) Concrete Barrier Construction. Conform to Article 621.03 of Georgia DOT Standard Specifications.

04) METHOD OF MEASUREMENT

A. Fence will be measured in linear feet, completed and accepted, and will include all hardware, labor, **concrete coring**, materials and workmanship necessary to install the various kinds of fencing indicated on the plans. This shall be full compensation for maintaining existing airport security perimeter fencing during construction.

B. Removal of chain-link fence, with or without barbed wire, regardless of height, shall be measured by the linear foot.

C. Each gate complete, in-place, and accepted will be measured for payment.

05) BASIS OF PAYMENT

A. Costs for fencing, gates, and fence removal associated with Staging Area Preparation shall be included in the lump sum price bid for Staging Area Preparation. The price bid shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete and maintain the item.

B. Payment for fence complete in place, including posts, hardware, and coring into concrete shall be made at the contract unit price bid per linear foot. The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete and maintain the item. The price shall also include the cost of providing temporary security fence

C. Payment for fence removal shall be made at the contract unit price bid per linear foot, without distinction as to size or type. The price shall be full compensation for all labor, tools, equipment and incidentals necessary to complete the item.

D. Each gate, complete, in-place, and accepted shall be paid for at the contract price bid per each. Such prices and payments shall be full compensation for furnishing all materials, fittings, and other appurtenances called for on the plans for all preparation, placing of materials, and for all labor, equipment, tools and incidentals necessary to complete the item.

E. Payment will be made under:

Item F-162-1 – 8' Black PVC Coated Fence with Extension Arms and 3 Strands of Barbed Wire Cored into Concrete - Per Linear Foot

Item F-162-2 – Removal of Chain Link Fence – Per Linear Foot

Item F-162-3 – 14' Wide, 8' Tall Black PVC-Coated Swing Gate – Per Each

Item F-162-4 – 8' Black PVC Coated Fence with Extension Arms and 3 Strands of Barbed Wire - Per Linear Foot

MATERIAL REQUIREMENTS

ASTM A121	Zinc-Coated (Galvanized) Steel Barbed Wire
ASTM A123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 392	Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 824	Metallic-Coated Steel Marcellled Tension Wire for Use with Chain-Link Fence
ASTM F 668	Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence
ASTM F 900	Standard Specification for Industrial and Commercial Swing Gates
ASTM F 1043	Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework
ASTM F 1083	Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F 1184	Standard Specification for Industrial and Commercial Horizontal Slide Gates
FED SPEC	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) RR-F-191/3
FED SPEC	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories) RR-F-191/4

END OF SECTION F-162

SECTION P-401**BITUMINOUS PAVEMENT****01) DESCRIPTION**

- (a) *This section shall consist of base, leveling, and surface courses composed of mineral aggregate and bituminous material mixed in a central mixing plant and placed on a prepared course in accordance with these specifications and shall conform to the lines, grades, thickness and typical cross-sections shown on the plans.*

- 1) *Each course shall be constructed to the depth, typical section or elevation required by the plans and shall be rolled, finished and approved by the Engineer before the placement of the next course.*

02) MATERIALS

- (a) **Aggregate.** *Aggregates shall consist of crushed stone with or without sand or other inert finely divided mineral aggregate. The portion of materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate and the portion passing the No. 200 sieve as mineral filler.*

- 1) **Coarse Aggregate.** *Coarse aggregate shall consist of sound, tough, durable particles, free from adherent films of matter that would prevent thorough coating with the bituminous material. It shall have a percentage of wear not greater than 50% for base course material and 47% for surface course material when tested in accordance with AASHTO T-96, nor shall the sodium sulfate soundness loss exceed 9%, after five cycles, when tested in accordance with AASHTO T-104.*

- i. *Crushed aggregate shall contain at least 50% by weight of crushed pieces having 2 or more fractured faces and 65% having at least one fractured face. The area of each face shall be equal to at least 75% of the smallest midsectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 50 degrees to count as two fractured faces.*

- ii. *The aggregate shall not contain more than 8%, by weight, of flat or elongated pieces. A flat particle is one having a ratio of width to thickness greater than five, an elongated particle is one having a ratio of length to width greater than five.*

- 2) **Fine Aggregate.** *Fine aggregate shall consist of clean, sound, durable, angular particles produced by crushing stone that meets the requirements for wear and soundness specified for coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. The fine aggregate, including any blended filler, shall have plasticity index of not more than six when tested in accordance with AASHTO T-90, and a liquid limit of not more than 25 when tested in accordance with AASHTO T-89.*

- i. The amount of natural sand that may be used in the bituminous mixes shall have the approval of the Engineer but shall not exceed 20% of the weight of the base course aggregate nor 15% of the weight of the surface course aggregate. The natural sand shall consist of grains of quartz or other hard, durable rock, and shall be free of lumps of clay, loam, organic matter, and other foreign matter.*
- 3) Sampling and Testing. All testing of aggregate samples shall be performed by the Contractor. Unless otherwise directed ASTM Standard D-75 shall be used in sampling of coarse aggregate and fine aggregate, and ASTM Standard C-183, Paragraphs 3 and 4, shall be used in sampling mineral filler. Sampling will be observed and supervised by the Engineer when deemed necessary. No aggregate shall be used in the production of mixtures without prior approval.*
- 4) Sources of Aggregates. Sources of the aggregate shall be selected well in advance of the time the materials are required in the work. When the aggregates are obtained from a previously approved source or an existing source producing aggregates that has a satisfactory service record in bituminous pavement construction for at least five (5) years, samples shall be tested prior to use. An inspection of the producer's operation will be made by the Engineer if deemed necessary. When new sources are to be developed, the Contractor shall indicate the sources and shall submit his plan for operation thirty (30) days in advance of starting production. Approval of the source of aggregate does not relieve the Contractor in any way of the responsibility for delivery at the job site of aggregates that meet the requirements specified herein.*
- 5) Samples of Aggregates. Samples of the aggregates shall be tested by the Contractor at the start of production and at intervals during production of bituminous mixtures. The samples shall be obtained at the processing plant, from railroad cars, truck, stockpiles, and other points in the process of production, transportation, and storage of aggregates. The intervals and points of sampling will be as designated elsewhere herein. The samples will be the basis of approval of specific lots of aggregates from the standpoint of the quality requirements of this paragraph. Samples of aggregates shall be obtained from the hot bins by trial runs the day before the start of production of paving mixture and from the hot bins at intervals during production of paving mixtures. The tested samples will be the basis of approval of specific lots of aggregates from the standpoint of gradation requirements specified hereinafter. Tested samples will also be the basis of approval from the standpoint of paving mixture requirements.*
- (b) Filler. If filler, in addition to that naturally present in the aggregate, is necessary, it shall consist of stone dust, loess, Portland cement, or other approved mineral matter. The filler material shall meet the requirements of AASHTO M-17.*
- (c) Bituminous Material.*
 - 1) The types, grades, controlling specifications and mixing temperatures for the bituminous materials are given below. The Contractor may use either the*

viscosity graded or the penetration graded asphalt cement but will not be allowed to change from one type to the other without the approval of the Engineer. If a change is approved, a new job mix formula will be required and the cost will be borne by the Contractor.

TYPE AND GRADE	SPECIFICATION	MIXING TEMPERATURE (F)
Asphalt Cement – Performance Grade PG76-22	AASHTO M-320	285 ⁰ - 335 ⁰ ₁

1. *Mixing, storage, and compaction temperatures at lab, plant, and site shall be in accordance with recommendations of the binder manufacturer*

- 2) *The Contractor shall furnish vendor's certified test reports for each tankload or equivalent of bitumen shipped to the project. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall be the basis for final acceptance.*

03) COMPOSITION

- (a) ***Composition of Mixtures.** The bituminous plant mixes shall be composed of a mixture of aggregate, filler if required, and bituminous material. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the applicable job mix formula.*

- (b) ***Job Mix Formulas.** No bituminous mixture for payment shall be produced until job mix formulas, as required, have been approved by the Engineer. The formulas shall be submitted in writing by the Contractor to the Engineer at least 30 days prior to the start of paving operations and shall indicate the definite percentage of each sieve fraction of aggregate, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. All test data used to develop the job formulas shall also be submitted. The job mix formula for each mixture shall be in effect until modified in writing by the Engineer. Should a change in sources of materials be made, a new job formula shall be established by the procedure specified hereinafter before the new material is used.*

- 1) *Each bituminous mixture shall be designed and shall meet the requirements hereinafter described when tested in accordance with standard Corps of Engineers test methods, described in Appendix V to the Corps of Engineers Manual EM 1110-45-302, covering Marshall procedures, bulk-impregnated specific gravity, and immersion/compression tests. The mixtures, when prepared in accordance with the standard Corps of Engineers Marshall procedures, shall have the following test properties:*

For nonabsorptive aggregate. When the water absorption value of the entire blend of aggregate does not exceed 2.5% as determined in accordance with AASHTO Standards T-84 and T-85, the aggregate is designated as nonabsorptive. The apparent specific gravity will be used in computing the voids and voids filled with asphalt, and the mixtures shall meet the following requirements:

NONABSORPTIVE-AGGREGATE MIXTURES

Test Property	Bituminous Base Course	Bituminous Leveling Course	Bituminous Surface Course
Number of Blows	75	75	50
Stability, minimum, pounds	3000	3000	1800
Flow, 1/100 inch units	8 min., 12 max	8 min., 12 max	8 min., 16 max
Voids total mix, percent	3-5	3-5	3-5
Voids filled with bitumen, percent	50-70*	50-70*	70-80

**The Engineer may permit deviation from the limits specified for voids filled with bitumen in order to stay within the limits specified for voids total mix*

For absorptive aggregate. When the water absorption value of the entire blend of aggregate exceeds 2.5% as determined in accordance with AASHTO Standards T-84 and T-85, the aggregate is designated as absorptive. The bulk-impregnated specific gravity determined in accordance with the standard Corps of Engineers method will be used in computing the percentages of voids total mix and voids filled with asphalt, and the mixture shall meet the following requirements:

ABSORPTIVE - AGGREGATE MIXTURES

Test Property	Bituminous Base Course	Bituminous Leveling Course	Bituminous Surface Course
Number of Blows	75	75	50
Stability, minimum, pounds	3000	3000	1800
Flow, 1/100 inch units	8 min., 12 max	8 min., 12 max	8 min., 16 max
Voids total mix, percent	3-5	3-5	2-4
Voids filled with bitumen, percent	55-75**	55-75*	75-85

***The Engineer may permit deviation from the limits specified for voids filled with bitumen in order to stay*

within the limits specified for voids total mix.

Immersion/Compression Tests. The composite mixture composed of the aggregate and bitumen to be used shall conform to the requirements hereinafter specified when subjected to the standard Corps of Engineers immersion test. If the index of retained stability of the specimens of the composite mixture is less than 75, the aggregates shall be rejected or the asphalt shall be treated with an approved anti-stripping agent. The amount of antistripping agent to be added to the asphalt shall be sufficient to produce an index of retained stability of not less than 75 when specimens of the mixture conforming to the proposed job mix formula using the treated asphalt are treated in accordance with the above immersion/compression

test. No additional payment will be made to the Contractor for any addition of antistripping agent that may be required.

- 2) The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory screens, will conform to the gradation of gradations specified by Table I. Tests for gradation of the coarse and fine aggregate shall be in conformance with AASHTO Standards T-11 and T-27. The gradations shown represent the extreme limits that will determine suitability of aggregate for use from all sources of supply. The aggregates as finally selected for use in the work shall have a gradation within the limits designated in the table and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be uniformly graded from coarse to fine. The table is based on aggregates of uniform specific gravity, and the percentages passing the various sieves will be subject to the appropriate correction by the Engineer when aggregates of varying specific gravities are used.

TABLE I - AGGREGATE - BITUMINOUS PAVEMENTS

Percentage by Weight Passing Sieves			
Sieve Size	Bituminous Base Course	Bituminous Leveling Course	Bituminous Surface Course
	1-1/2" Max	3/4" Max	3/4" Max
1-1/2 inch	100	----	----
1 inch	75-100	----	----
3/4 inch	68-87	100	100
1/2 inch	59-77	82-100	82-100
3/8 inch	53-70	75-90	75-90
No. 4	39-55	60-73	60-73
No. 10	27-42	43-57	43-57
No. 20	17-30	29-43	29-43
No. 40	13-23	19-33	19-33
No. 80	7-15	10-20	10-20
NO. 200	3-7	3-6	3-6

Bitumen Percent	4-6	5-7.5	5-7.5
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The selection of either of the gradations shown for the bituminous surface course in Table I shall be such that the maximum size aggregate used shall be not more than one-half the thickness of the layer of the surface course being constructed.

- 3) *After the job mix formula is established, the mixtures furnished for the project shall conform within the applicable following tolerances:*

TABLE II - JOB MIX FORMULA TOLERANCES***Tolerance - Plus or Minus***

Material	Bituminous Base Course	Bituminous Leveling Course	Bituminous Surface Course
Aggregate passing No. 4 sieve or larger	5%	4%	4%
Aggregate passing No. 10, 20, 40, and 80 sieves	4%	3%	3%
Aggregate passing No. 200 sieve	1.5%	1.5%	1.5%
Bitumen	0.25%	0.25%	0.25%
Temperature of mixing	25° F	25° F	25° F

The aggregate gradation may be adjusted within the limits of the tables specified herein, as directed, without adjustments in the Contract unit prices. The percentages of each sieve fraction in the job mix formula will be restricted to values such that application of the aforementioned tolerances will not cause limits in the gradation tables to be exceeded.

- 4) *Sampling and testing of bituminous mixtures will be accomplished by representatives of the Contractor, and submitted to the Engineer for his review. Testing for conformance with the specified test properties will be done by the Contractor for all mix design submittals. In the event that the initial mix design submittal is not approved, the Contractor shall redesign the mix and resubmit it to the Engineer. Mixtures that do not conform to the specified test properties will be rejected as directed. No payment will be made to the Contractor for mixture rejected or for pavements or portions of pavement removed.*

5) **JOB MIX FORMULA CHECKLIST**

The Contractor shall submit the following data prior to evaluation and approval of the asphaltic concrete mix design:

i) General

- A) Project and project number.*
- B) Type of bituminous mixture.*
- C) Type and source of aggregates.*
- D) Type and source of asphaltic cement.*

ii) Aggregate

- A) Sieve analysis of each aggregate to be used in mixture.*
- B) Physical tests of aggregates.*
- C) Specific gravity and absorption of each type aggregate.*
- D) Proportion used of each type aggregate.*
- E) Theoretical gradation of combined proportions of aggregates.*

iii) Bituminous Materials.

- A) Type and penetration.**
- B) Specific gravity.**

iv) Bitumen Content Determination

- A) Resistance to plastic flow of bituminous mixtures.**
 - 1) Mixing and compacting temperatures for specimen.**
 - 2) Compactive effort (number of blows applied to specimen each, face).**
 - 3) Actual specific gravity and unit weight of each specimen.**
 - 4) Percent, asphalt cement in each specimen.**
 - 5) Theoretical specific gravity of each specimen.**
 - 6) Graph of stabilities versus asphalt cement contents.**
 - 7) Graph of flow values versus asphalt cement contents.**
 - 8) Graph of voids filled versus asphalt cement contents.**
 - 9) Graph of air voids versus asphalt cement contents.**
 - 10) Graph of unit weight versus asphalt cement contents.**

v) Summation of Established Job Mix Formula

- A) Combined gradation of aggregates.**
- B) Optimum asphalt cement content from graphs.**
- C) Specified job mix tolerance range.**

vi) Summation of the Characteristics of the Mixture of Optimum Asphalt Cement Content

- A) Stability, pounds**
 - B) Flow value, hundredths of an inch.**
 - C) Actual specific gravity of laboratory compacted mixture.**
 - D) Theoretical specific gravity of laboratory mixture.**
 - E) Total voids (air), percent, in laboratory compacted mixture.**
 - F) Voids filled with bitumen, percent, in laboratory compacted mixture.**
 - G) Actual unit weight, PCF, of laboratory compacted mixture.**
 - H) Specifications for above, where applicable.**
- 6) Test Section.** Prior to full production, the Contractor shall prepare a quantity of bituminous mixture according to the job mix formula. The amount of mixture should be sufficient to construct a test section 50' long and 20' wide, or other appropriate dimensions as directed by the Engineer, placed in two sections and shall be of the same depth specified for the construction of the course which it represents. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

As soon as the test section pavement cools sufficiently, samples of finished pavement, including samples that span the longitudinal joint shall be taken and tested to determine conformance to density, gradation, bitumen content, and other specified requirements.

A sample of paving mixture adequate for the preparation of four (4) test specimens shall be obtained from the truckload of mixture used for the test strip. Four specimens shall be compacted and tested in accordance with standard procedures cited previously. Determination shall be made that these data conform to final design data at the same bitumen content within reasonable tolerances before full plant production is allowed. Maximum tolerances that are considered reasonable are shown in Table III. In no case, however, will the plant-produced mix be considered acceptable if the mix properties do not meet the requirements of design criteria.

TABLE III

Test	Tolerances
Stability	10%
Flow	2 points
Unit Weight	1.5 pounds

In the event tests indicate the pavement does not conform to specification requirements, necessary adjustments to plant operation and/or rolling procedures shall be made. Additional test sections shall be constructed and sampled to determine conformance to specification requirements as directed. In no case shall the Contractor start full production without approval of the Engineer. In the event the test sections do not conform to specification requirements, the Contractor shall remove the pavement as directed at no expense, and no payment will be made for materials and labor employed either in placement or removal of the test pavement.

The plant will not be placed in continuous operation until the variations in test properties are within allowable tolerance. Once the plant has been placed in continuous operations, test specimens shall be prepared at least two times daily. The test conducting shall include stability, flow, unit weight, voids in the total mix and percent voids filled with bitumen. Tolerances cited above are applicable for the continuation of plant production.

7) ASPHALT PLANT CONTROL

The following items will be monitored continuously during placement of asphaltic materials. The Contractor's testing laboratory shall test to obtain and record the following information and submit it to the Engineer:

i) Plant Hot Bin Gradation Analyses. (At least twice daily during normal

operations.)

- A) Sieve analysis of aggregates in each hot bin.**
- B) Proportions of aggregate types extracted from each hot bin.**
- C) Theoretical gradation of combined proportions of aggregates.**

ii) Batch Plant Tabulations. (At least twice daily during normal operations.)

- A) Weights of asphalt and each hot bin aggregate in a weigh batch plant, or**
- B) Data used to ascertain correct proportions of materials in a continuous mix plant.**

iii) Quantitative Extraction of Bitumen From Bituminous Paving Mixtures. (At least twice daily during normal operations.)

- A) Correction for the mineral aggregate passing filter ring.**
- B) Correction for the mineral aggregate passing filter ring with extract.**
- C) Total corrected amount of bitumen.**
- D) Mechanical analysis of extracted aggregates.**

iv) Characteristics of Paving Mixture. (At least twice daily during normal operations.)

- A) Resistance to plastic flow of bituminous mixture.**
 - 1) Compactive effort (number of blows applied to specimens, each face).**
 - 2) Stability of laboratory compacted mixture, pounds.**
 - 3) Flow value, hundredths of an inch.**

v) Temperatures. (At least six times daily during normal operations.)

- A) Aggregates, hot elevator.**
- B) Bitumen, storage tank.**
- C) Mixture in truck, plant.**
- D) Mixture spreader, job site.**

vi) Completed Bituminous Pavement. (At least four times daily during normal operations.)

- A) Field density.**
- B) Percent of laboratory density (show standard used).**
- C) Core thickness. (Additional cores for thickness measurements shall be taken at the rate of one (1) per 200 tons of pavement placed.)**
- D) Extraction analysis (asphalt content and aggregate gradation).**

vii) Amount of Asphaltic Concrete Placed.

- A) *Previously placed.*
- B) *Placed on data report.*
- C) *Total tonnage placed.*

viii) *Job Mix Design Tolerances for Above, Where Applicable.*

04) **CONSTRUCTION METHODS**

- (a) **Weather and Seasonable Limitations.** *Bituminous mixtures shall be constructed only upon a dry surface, when the atmospheric temperature is above 40°F, and when the weather is not foggy or rainy. The temperature requirements may be waived, but only when so directed by the Engineer.*
- (b) **Bituminous Mixing Plant.** *Plants used for the preparation of bituminous mixtures shall conform to the requirements of AASHTO M-156 with the following changes:*

1) **Requirements for all plants.**

- i. ***Truck scales.*** *The bituminous mixture shall be weighed on approved scales furnished by the Contractor, or on public scales at the Contractor's expense. Such scales shall be inspected and sealed as often as the Engineer deems necessary to assure their accuracy. Scales shall conform to the following requirements.*

Scales for weighing materials which are required to be proportioned by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales.

Scales shall be accurate within one-half percent of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the inspector before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed one-tenth of one percent of the nominal rated capacity of the scale, but not less than one pound. The use of spring balances will not be permitted.

Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and inspector can safely and conveniently view them.

Scale installations shall have available 10 standard fifty-pound weights for testing the weighing equipment or suitable weights and devices for other approved equipment.

Scales must be tested for accuracy and serviced before use at a new site. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales "overweighing" (indicating more than correct weight) will not be permitted to operate and all materials received subsequent to the last previous correct weighing-accuracy-test will be reduced by the percentage of error in excess of one-half of one percent.

In the event inspection reveals the scales have been "underweighing" (indicating less than correct weight) they shall be adjusted.

All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning, shall be included in the amount bid.

- ii. Testing laboratory. The Contractor or producer shall provide facilities for a testing laboratory for control and acceptance testing functions during periods of mix production, sampling, and testing and whenever materials subject to the provisions of these specifications are being supplied or tested. The laboratory shall provide adequate equipment, space, and utilities as required for the performance of the specified tests.***
- iii. Inspection of plant. The Engineer or his authorized representative shall have access, at all times, to all parts of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and character of materials; and checking the temperatures maintained in the preparation of the mixtures.***
- iv. Storage bins and surge bins. Use of surge bins or storage bins for temporary storage of hot bituminous mixtures will be permitted as follows:***
 - (a) The bituminous mixture may be stored in surge bins for period of time not to exceed 3 hours.***
 - (b) The bituminous mixture may be stored in insulated storage bins for a period of time not to exceed 24 hours, provided an inert gas atmosphere is maintained in the bin during the storage period.***

The bins shall be such that mix drawn from the bin meets the same requirements as mix loaded directly into trucks.

If the Engineer determines that there is an excessive amount of heat loss, segregation and/or oxidation of the mixture due to temporary storage, no overnight storage will be allowed.
- (c) Hauling Equipment. Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, so that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated and covers shall be securely fastened.***
- (d) Bituminous Pavers. Bituminous pavers shall be self-contained, powerpropelled units with an activated screed or strike-off assembly, heated if necessary, and shall be capable of spreading and finishing courses of bituminous plant mix materials which will meet the specified thickness, smoothness, and grade. Pavers used for roadways,***

shoulders and similar construction shall be capable of spreading and finishing courses of bituminous plant mix material in widths shown on the plans.

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

The paver shall be capable of operating at forward speeds consistent with satisfactory laying of the mixture.

Automatic grade control devices shall be used. The paver shall be equipped with a control system capable of automatically maintaining the screed elevation as specified herein. The control system shall be automatically actuated from either a reference line or surface through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent.

The controls shall be capable of working in conjunction with any of the following attachments:

- 1) Ski-type device of not less than 30 feet in length or as directed by the Engineer.***
 - 2) Taut stringline (wire) set to grade.***
 - 3) Short ski or shoe.***
- (e) Rollers. Rollers may be of the vibratory, steel wheel, or pneumatic-tired type. They shall be in good condition, capable of reversing without backlash, and operating at slow speeds to avoid displacement of the bituminous mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density without detrimentally affecting the compacted material. The use of equipment which results in excessive crushing of the aggregate will not be permitted.***
- (f) Preparation of Bituminous Material. The bituminous material shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the bituminous material delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles but shall not exceed 325°F.***
- (g) Preparation for Mineral Aggregate. The aggregate for the mixture shall be dried and heated at a paving plant before entering the mixer. When introduced into the mixer, the combined aggregate shall contain no more than 0.5% moisture if asphalt, or more than 1% if tar mixtures. Water in the aggregate shall be removed by heating to the extent that there is no subsequent foaming in the mixture prior to the placing of the material. The aggregate shall be heated to the temperature designated by the job***

formula within the job tolerance specified. The maximum temperature and rate of heating shall be such that no permanent damage occurs to the aggregates. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The aggregate shall be screened to specified sizes and conveyed into separate bins ready for mixing with bituminous material.

- (h) **Preparation of Bituminous Mixture.** *Before delivery, the aggregate shall be mixed with the bituminous material at a central mixing plant. The mixture shall be prepared at a temperature shown in 02(c) above.*

The dry aggregates, prepared as prescribed in 03(g) above, shall be combined in the plant in the proportionate amounts of each fraction of aggregate required to meet the specified gradation. The quantity of aggregate for each batch shall be determined, measured and conveyed into the mixer. In case of volumetric proportioning, the size of the gate openings shall be determined, and the gates locked in position.

The quantity of bituminous material for each batch or calibrated amount for continuous mixer shall be approved by the Engineer. It shall be measured by weight and introduced into the mixer at the specified temperature, using the lowest range possible for adequate mixing and spreading. For batch mixers, all mineral aggregates shall be in the mixer before the bituminous material is added. The exact temperature within the specified range shall be approved by the Engineer. In no case shall aggregate be introduced into the mixture at a temperature more than 25°F above the temperature of the bituminous material. As approved by the Engineer, the mixing shall continue for the time necessary to coat all particles uniformly. This time is dependent upon the mix design and the type of mixing equipment used. To compute the mixing time in a continuous mixer, the weight of its contents at operating level is divided by the weight of the mixture delivered per second by the mixer:

$$\text{Mixing time in seconds} = \frac{\text{Pugmill dead capacity in pounds}}{\text{Output in pounds per second}}$$

- (i) **Transporting, Spreading, and Finishing.** *The mixture shall be transported from the mixing plant to the point of use in vehicles described in Paragraph 03(c) above. Deliveries shall be scheduled so that spreading and rolling of all mixture prepared for one day's run can be completed during daylight, unless adequate artificial lighting is provided. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.*

Immediately before placing the bituminous mixture, the underlying course shall be cleared of all loose or deleterious material. A power sweeper equipped with a blower shall be used, supplemented with hand brooms if necessary, or the material shall be removed by other means as directed by the Engineer.

The mixture shall be laid only upon an approved underlying course which is dry and in suitable condition, and when weather conditions are favorable. No mixture shall be placed when the air temperature in the shade and away from artificial heat is 40°F., or lower, unless so directed by the Engineer. The Engineer may permit work to continue when overtaken by sudden rains only to provide for laying that material which is in transit from the plant, provided the mixture is within the temperature limits specified. The mixture shall be placed at a temperature between 150°F. and 225°F., when tar is

used and between 250°F. and 300°F., when asphalt cement is used. When the mixture is being placed during warm weather and the Engineer has determined that satisfactory results can be obtained at lower temperatures, he may direct that the mixture be mixed and delivered at the lower temperature.

Grade control between the edges of the pavement shall be accomplished by grade stakes or steel pins placed in lanes parallel to the centerline of the pavement and at intervals sufficiently close that string lines may be stretched between stakes or pins.

Placing shall commence at the point(s) farthest from the mixing plant and progress continuously toward the plant, unless otherwise ordered by the Engineer.

Upon arrival, the mixture shall be spread to the full width by an approved bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and shall conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise directed, placing shall begin along the centerline of areas to be paved on a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet, except where edge lanes require strips less than 10 feet to complete the area. The longitudinal joint in one layer shall offset that in the layer immediately below by at least 2 feet; however, the joint in the top layer shall be at the centerline of the pavement. A 16-foot straightedge shall be placed across the longitudinal joints between adjacent lanes to determine if the surface conforms to the grade and contour requirements.

Transverse joints in one layer shall be offset by at least 2 feet from transverse joints in the previous layer. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet.

Exposed vertical edges of paved strips shall be free of all accumulations of dirt or other foreign material before any mixture is spread in an adjacent lane. The contact surfaces shall be given a brush coat of asphalt.

In lieu of painting the contact surface, the Contractor may use a joint heater approved by the Engineer. If the spreading machine should drift from an adjacent lane during construction, the unfilled space shall be carefully filled with fresh hot mixture obtained from the truck or the hopper of the spreading machine. Stealing mixture from that already spread to fill up these area shall not be permitted.

In areas where, because of irregularities or unavoidable obstacles, the use of mechanical spreading and finishing equipment is impractical, the mixture may be hand spread.

When hand spreading is permitted, the mixture shall be dumped on approved dump sheets outside of the area upon which it is to be spread, and then distributed into place immediately with hot shovels. It shall be spread with hot rakes in a uniformly loose layer to the full width required and of such depth that, when the work is completed, it will have the required thickness and will conform to the grade and surface contour shown on the plans.

- (j) **Compaction of Mixture.** After spreading, the mixture shall be thoroughly and uniformly compacted with power rollers, as directed by the Engineer. Rolling of the mixture shall begin as soon after spreading as it will bear the roller without undue displacement or hair checking. Rolling shall be initiated with the drive wheel toward the paving machine. The sequence of rolling for the first paving lane should be to first roll the lower edge (with reference to the transverse slope) of the lane and then roll the upper edge. The interior of the lane should then be rolled from the lower side toward the upper with overlapping roller paths. On adjoining paving lanes rolling shall begin by overlapping the joint (with the previous lane) by 6 to 8 inches and then rolling the outside edge of the new lane. The interior is rolled from the outside edge toward the compacted joint with overlapping wheel paths. Alternate paths of the roller shall be of slightly different lengths.

The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once by rakes and fresh mixture.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until all roller marks are eliminated, the surface is of uniform texture and true to grade and cross section, and a field density is obtained of at least 98% and not more than 100% of the density of laboratory specimens (prepared by the method herein before referenced) molded from a sample taken from the same truck-load as the in-place density sample.

The Contractor shall utilize a nuclear device to monitor rolling patterns and density during compaction. Acceptance testing is to be performed as described elsewhere herein.

The Contractor will obtain a test core for each 200 tons of asphalt construction for thickness measurements. Test cores may be procured at joints if directed. The holes for the cores shall be refilled with like material that same day.

To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened, but excessive water will not be permitted. Pneumatic tired rollers may not require the use of water. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hot hand tampers.

Any mixture which becomes loose and broken, mixed with dirt, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work will be done at the Contractor's expense. Skin patching shall not be allowed, unless specifically approved by the Engineer.

- (k) **Joints.** The formation of all joints shall be made in such a manner as to ensure a continuous bond between old and new sections of the course. All joints shall present the same texture, density, and smoothness as other sections of the course.

The roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a transverse joint. When necessary to form a transverse joint,

it shall be made by means of placing a bulkhead or by tapering the course, in which case the edge shall be cut back to its full depth and width on a straight line to expose a vertical face. In both methods all contact surfaces shall be given a tack coat of bituminous material before placing any fresh mixture against the joint.

Longitudinal joints which are irregular, damaged, or otherwise defective shall be cut back to expose a clean, sound surface for the full depth of the course.

All contact surfaces shall be given a tack coat of bituminous material prior to placing any fresh mixture against the joint.

- (l) Shaping edges. While the surface is being compacted and finished, the Contractor shall carefully trim the outside edges of the pavement to the proper alignment. Edges so formed shall be leveled while still hot with the back of a rake or a smoothing iron and thoroughly compacted by tampers or by other satisfactory methods.*
- (m) Surface Tests. Tests for conformity with specified crown and grade shall be made by the Contractor immediately after initial compression. Any variation shall be corrected by the removal or addition of materials and by continuous rolling.*

The finished surface shall not vary more than 1/4 inch for the surface course when tested with a 16 foot straightedge applied parallel with, or at right angles to, the centerline.

After the completion of final rolling, the smoothness of the course shall again be tested; humps or depressions exceeding the specified tolerances or that retain water on the surface shall be immediately corrected by removing the defective work and replacing with new material, as directed by the Engineer. This shall be done at the Contractor's expense.

The finished surfaces of bituminous courses shall not vary from the grade line, elevations and cross sections shown on the Contract drawings by more than 1/4 inch. The Contractor shall correct pavement areas varying in excess of this amount by removing and replacing the defective work. No additional payment shall be made for this corrective work. Skin patching will not be permitted.

- (n) Sampling Pavement. Core samples for determination of composition, compaction, thickness, and density of completed pavements shall be obtained by the Contractor. The size, number, and locations of the samples will be as directed by the Engineer. Samples shall be taken for each day or fraction thereof and shall be neatly cut with a saw, core drill, or other approved equipment. The Contractor shall furnish all tools, labor, and materials for replacing pavement at no additional payment. If the pavement is deficient in composition, compaction, or thickness satisfactory correction shall be made.*
- (o) Bituminous and Aggregate Material Contractor's Responsibility. Tests of the bituminous and aggregate material that the Contractor proposes to use, together with a statement of their source and character, must be submitted and approval must be obtained before use of such material begins. The Contractor shall require the manufacturer or producer of the bituminous and aggregate materials to furnish material subject to this and all other pertinent requirements of the Contract. Only*

those material which have been tested and approved for the intended use shall be accepted.

- 1) The Engineer or his authorized representative shall have access, at all times, to all parts of the paving plant for the purpose of inspecting the equipment, the conditions and operations of the plant, for the verification of weights or proportions and character of materials, and to determine the temperatures maintained in the preparation of the mixtures.*
- 2) The Contractor shall furnish vendor's certified tests for each carload or equivalent of bitumen shipped to the project. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verification by testing sample materials received for use on the project.*

05) METHOD OF MEASUREMENT

- (a) The tonnage of plant mix bituminous pavements to be paid for shall be the number of tons of bituminous mixture of the gradations specified herein and used in the accepted work. The bituminous pavement materials shall be weighed after mixing and no deduction shall be made for the weight of bituminous material in the mixtures.*

No payment will be made for materials placed in excess of 1/4" additional thickness above the plan requirements. Deductions will be made for excesses and/or deficiencies in thickness based on the individual lots of 50 tons of bituminous material placed, as determined by the cores. All bituminous material placed outside the neatlines of the section shown on the plans will be deducted, with the exception of a one-to-one wedge at the free edge(s).

- (b) No distinction will be made between bituminous base courses placed using recycled pavements and those placed using all new materials.*

06) BASIS OF PAYMENT

- (a) Payment shall be made at the respective Contract unit prices per ton for bituminous base course, and bituminous surface course. The prices shall be full compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.*

- (b) Payment will be made under:*

Item P-401-1 Bituminous Surface Course - Per Ton.

TESTING REQUIREMENTS

AASHTO T-96	Abrasion
AAASHTO T-104	Soundness

AASHTO T-19	Slag
AASHTO T-89	Liquid Limit
AASHTO T-90	Plastic Limit and Plasticity Index
AASHTO T-101	Swell
AASHTO T-182	Striping
ASTM D-75	Aggregate, Sampling
ASTM C-189	Hydraulic Cement, Sampling
AASHTO T-11 and T-17	Gradation
AASHTO T-84 and T-85	Specific Gravity
AASHTO T-30	Mechanical Analysis of Extracted Aggregate
ASTM C-29	Unit Weight of Aggregate
ASTM C-88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C-131	Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C-136	Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C-183	Sampling Hydraulic Cement
ASTM D-75	Sampling Aggregates
ASTM D-423	Liquid Limit of Soils
ASTM D-424	Plastic Limit and Plasticity Index of Soils
ASTM D-995	Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
ASTM D-1075	Effect of Water on Cohesion of Compacted Bituminous Mixtures
ASTM D-1188	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens

<i>ASTM D-1559</i>	<i>Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus</i>
<i>ASTM D-2172</i>	<i>Quantitative Extraction of Bitumen from Bituminous Paving Mixtures</i>
<i>ASTM D-2489</i>	<i>Degree of Particle Coating of Bituminous-Aggregate Mixtures</i>
<i>ASTM D-2726</i>	<i>Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens</i>
<i>ASTM D-2950</i>	<i>Density of Bituminous Concrete in Place by Nuclear Method</i>
<i>ASTM D-3665</i>	<i>Random Sampling of Paving Materials</i>
<i>ASTM D-3666</i>	<i>Inspection and Testing Agencies for Bituminous Paving Materials</i>
<i>E-1110-45-302</i>	<i>Appendix V - Corps of Engineers Manual</i>

The Asphalt Institute's Manual No. 2 (MS-2) - Mix Design Methods for Asphalt Concrete

MATERIAL REQUIREMENTS

AASHTO M-17	Filler
AASHTO M-20	Asphalt Cement
AASHTO M-52	Tar
ASTM D-242	Mineral Filler for Bituminous Paving Mixtures
ASTM D-490	Tar
ASTM D-946	Asphalt Cement for Use in Pavement Construction
ASTM D-3381	Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM M-226	Viscosity Graded Asphalt Cement

END OF SECTION P-401

SECTION P-602 BITUMINOUS PRIME COAT**01) DESCRIPTION**

- (a) *This section shall consist of an application of bituminous material on the prepared base course in accordance with this specification applied at the rate specified by the Engineer. The type of bituminous material to be used shall be selected by the Engineer from those included in this specification.*
- (b) *Quantity of Material. The approximate amount of bituminous material per square yard for the prime coat shall be as provided in Table 1.*

TABLE 1. - QUANTITY OF MATERIAL

Material	Amount
Bituminous Material	0.25 to 0.50 gallon per sq. yd.

02) MATERIAL

- (a) *The types, grades, controlling specifications and application temperatures for the bituminous materials are given below. The Engineer shall designate the specific material to be used.*

Type and Grade	Specification	Application Temp.
Liquid Asphalt RC-70/MC-70	AASHTO M-81/M-82	120°F. - 160°F.
RC-250/MC-250	AASHTO M-81/M-82	160°F. - 200°F.
Tar		
RT-2	AASHTO M-52	60°F. - 125°F.
RT-3	AASHTO M-52	80°F. - 120°F.

03) CONSTRUCTION METHODS

- (a) *Weather Limitations. The prime coat shall be applied only when the existing surface is dry or contains sufficient moisture to get uniform distribution of the bituminous material, when the atmospheric temperature is above 60°F., and when the weather is not foggy or rainy. The temperature requirements may be waived, but only when so directed by the Engineer.*
- (b) *Equipment. The equipment used by the Contractor shall include a self-powered pressure bituminous material distributor and equipment for heating bituminous material.*

- 1) *The distributor shall have pneumatic tires of such width and number that the load produced on the surface shall not exceed 650 pounds per inch of tire width and shall be designed, equipped and operated so that bituminous material is applied at readily controlled rates from 0.05 to 2.0 gallons per square yard. The material shall be applied within a pressure range from 25 to 75 pounds per square inch and with an allowable variation from any specified rate not to exceed 5 percent. Distributor equipment shall include a thermometer for reading temperatures of tank contents.*
- (c) *Application of Bituminous Material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.*
- 1) *The application of the bituminous material shall be made by means of a pressure distributor at the temperature, pressure and in the amounts directed by the Engineer.*
 - 2) *Following the application, the primed surface shall be allowed to dry not less than 48 hours without being disturbed or for such additional time as may be necessary to permit the drying out of the prime until it will not be picked up by traffic or equipment. This period shall be determined by the Engineer. The surface shall then be maintained by the Contractor until the surfacing has been placed. Suitable precautions shall be taken by the Contractor to protect the primed surface against damage during this interval, including supplying and spreading any sand necessary to blot up excess bituminous material.*
- (d) *Bituminous Material Contractor's Responsibility. Samples of the bituminous material that the Contractor proposes to use, together with a statement as to their source and character, must be submitted and approved before use of such material begins. The Contractor shall require the manufacturer or producer of the bituminous materials to furnish material subject to this and all other pertinent requirements of the contract. Only satisfactory materials, so demonstrated by service tests, shall be acceptable.*
- The Contractor shall furnish vendor's certified test reports for each carload, or equivalent, of bituminous material shipped to the project. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as basis for final acceptance. All such test reports shall be subject to verification by testing samples of materials received for use on the project.*
- (e) *Freight and Weigh Bills. Before final estimate is allowed, the Contractor shall file with the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the bituminous materials actually used in the construction covered by the contract. The Contractor shall not remove bituminous material from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer. Copies of freight bills and weigh bills shall be furnished to the Engineer during the progress of the work.*

04) METHOD OF MEASUREMENT

- (a) *The bituminous prime coat to be paid for shall be the number of gallons used as ordered for the accepted work, corrected to 60°F, in accordance with the temperature-volume correction tables for asphalt and tar materials contained in ASTM D-1250 and ASTM D-63, respectively.*

05) BASIS OF PAYMENT

- (a) *Payment shall be made at the contract unit price per gallon of bituminous prime coat. Payment shall be full compensation for furnishing all materials, labor, tools, and incidentals necessary to complete the items.*

- (b) *Payment shall be made under:*

Item P-602-1- Bituminous Prime Coat – Per Gallon

TESTING AND MATERIAL REQUIREMENTS**Test and Short Titles**

**ASTM D-1250 -- Volume Correction
for Asphalts**

**ASTM D-633 -- Volume Correction
for Tars**

Material and Short Title

**AASHTO M-81 -- Asphalt RC
AASHTO M-52 -- Tar**

END OF SECTION P-602

SECTION T-904 SODDING**01) DESCRIPTION**

- a) *This item shall consist of furnishing, hauling, and placing approved live sod on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the Engineer. Work shall consist of developing a grass cover on unpaved areas which are exposed, or damaged during construction operations, not to exceed 10' outside of construction limits, as shown on the plans, or as directed by the Engineer in accordance with these specifications.*
- b) *These specifications are to be used as a guide to enable the Contractor to develop a satisfactory stand of grass. The Contractor shall visit the site and acquaint himself as to the nature and condition of the soil and the extent of the work required prior to bidding. The Contractor shall have the soil tested to determine the actual rates and/or types of lime, fertilizer, and other soil amendments required. Prior to construction, the Contractor shall submit a sodding plan to the Engineer for review. In addition to the above, it shall also include his methods of maintenance, watering, repairing, fertilizing, mowing and recommendations for future maintenance by the City.*
- c) *Areas that have previously been sodded and are unnecessarily disturbed during construction shall be resodded and, if necessary, re-sloped and mulched at no expense to the City.*

02) MATERIALS

- a) *Sod. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials that might be detrimental to the development of the sod or to future maintenance. At least 75% of the plants in the cut sod shall be composed of the species stated herein, and any vegetation more than 6 inches in height shall be mowed to a height of 3 inches or less before sod is lifted. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than that stated in Section 03)d). Sod which has become wet, moldy, or otherwise damaged in transit or storage will not be acceptable. Sod that is excessively dried out, exposed to heat, or not viable will also be rejected.*

Sod will be obtained from approved nurseries that have a Georgia Live Plant License.

Between April 15 and June 30, Bermuda sod shall be installed. Between September 1 and October 31, seeding and mulching shall be applied until the time is acceptable for placement of Bermuda sod as noted above.

- b) *Fertilizer. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen,*

available phosphoric acid, and water-soluble potash. They shall meet the requirements of Fed. Spec. A-A-1909 and the Georgia Plant Food Act in effect at the date of Bid Advertisement. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers. The fertilizers may be supplied in one of the following forms:

- a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;*
 - b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or*
 - c. A granular or pellet form suitable for application by blower equipment.*
- c) Water. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass. It shall be subject to the approval of the Engineer prior to use. A hydrant that is available to draw potable water from is available in front of the DOA Tech Campus and is shown on the drawings. A meter will be required prior to use.*
- d) Soil for Repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps or other materials that will interfere with subsequent sod installation, compacting and establishing turf and shall be approved by the Engineer before being placed.*

03) CONSTRUCTION METHODS

- a) General. Areas to be solid, strip, or spot sodded shall be shown on the plans. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition that are to remain undisturbed shall also be shown on the plans. Suitable equipment necessary for proper preparation of the ground surface and for the handling and placing of all required materials shall be on hand, in good condition, and shall be approved by the Engineer before the various operations are started. The Contractor shall demonstrate to the Engineer before starting the various operations that the application of required materials will be made at the specified rates.*
- b) Preparing the ground surface. After grading of areas has been completed and before applying fertilizer and limestone, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.*
- c) Applying fertilizer and ground limestone. Following ground surface preparation, fertilizer shall be uniformly spread at a rate which will provide*

not less than the minimum quantity of each fertilizer ingredient, as stated in the soil test results. If use of ground limestone is required, it shall then be spread at a rate that will provide not less than the minimum quantity stated in the special provisions. These materials shall be incorporated into the soil to a depth of not less than 2 inches by discing, raking, or other methods acceptable to the Engineer. Any stones larger than 2 inches in any diameter, large clods, roots, and other litter brought to the surface by this operation shall be removed. The contractor's soils analysis report should be reviewed for specific fertilizer recommendations.

- d) **Obtaining and delivering sod.** *After inspection and approval of the source of sod by the Engineer, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches. Sod sections or strips shall be cut in uniform widths, not less than 10 inches, and in lengths of not less than 18 inches, but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside.*

The Contractor shall be required to mow high grass before cutting sod. The sod shall be transplanted within 72 hours from the time it is harvested. Sod that is not transplanted within 24 hours shall be stacked, kept moist, and protected from exposure to heat, direct sunlight, and freezing until it is transplanted. Contractor shall not exceed the 72-hour time limit for transplanting all of the harvested sod. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, permission to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

- e) **Laying sod.** *Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the Engineer, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches immediately prior to laying the sod.*

The sod shall be moist and shall be placed on a moist earth bed. Pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface, and insure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen when replacing it shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately 1 inch below the pavement edge. Where the flow will be over the sodded areas

and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with pavement edges. All sod placed under this contract shall be pegged to resist disturbance from aircraft blast or weather.

On slopes steeper than 1 vertical to 2-1/2 horizontal and in v-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches in length and have a cross-sectional area of not less than 3/4 square inch. The pegs shall be driven flush with the surface of the sod.

- f) **Watering.** *Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner that will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.*
- g) **Establishing turf.**
 - i) **General.** *The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work.*
 - ii) **Protection.** *All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the Engineer.*
 - iii) **Mowing.** *The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. In the event that weeds or other undesirable vegetation are permitted to grow to such an extent that, either cut or uncut, they threaten to smother the sodded species, they shall be mowed and the clippings raked and removed from the area.*
- h) **Repairing.** *When the surface has become gullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the condition of the soil, as directed by the Engineer, and shall then be sodded as specified in Section 03) (e) of this specification.*

04) METHOD OF MEASUREMENT

- a) *This item shall be measured on the basis of the area in square yards of the surface covered with sod and accepted.*

05) BASIS OF PAYMENT

- a) *This item will be paid for on the basis of the contract unit price per square yard for sodding, which price shall be full compensation for all labor, equipment, material, staking, and incidentals necessary to satisfactorily complete the items as specified.*
- b) *Payment will be made under:*
 - Item T-904-1 – Sodding – per Square Yard*

MATERIAL REQUIREMENTS

ASTM C 602	Agricultural Liming Materials
GDOT Section 890.2.02	Sod
GDOT Section 891	Fertilizer

END OF SECTION T-904



1. EDGE LIGHTS ARE PRESENT ON RUNWAY AND TAXIWAY SHOULDERS. LOCATIONS SHOWN ON DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE AND PROTECT LIGHTS TO AVOID DAMAGING THEM AND SHALL TAKE PRECAUTIONS TO AVOID SPRAYING LIGHTS WITH THERMOPLASTIC COAL TAR EMULSION SEALCOAT. CLEANING AND/OR REPAIRING EDGE LIGHTS DAMAGED OR SPRAYED BY THE CONTRACTOR SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE CITY.

2. CONTRACTOR SHALL RESTORE ALL SHOULDER MARKINGS OBLITERATED BY APPLICATION OF COAL TAR SEALER/REJUVENATOR. PAINT SHALL BE APPLIED AT THE RATE OF 75 SQUARE FEET PER GALLON FOR FRESHLY SEALCOATED AREAS.

3. FOR RUNWAY AND TAXIWAY CLOSURE REQUIREMENTS SEE SHEET G.3.2-G.4.2.

4. CONTRACTOR SHALL PROTECT ALL ELECTRICAL MANHOLES/HANDHOLES AND UNDERDRAIN CLEANOUTS DURING OPERATIONS. CONCRETE-FILLED ELECTRICAL CONDUIT TRENCHES IN THE SHOULDER SHALL BE PROTECTED THROUGHOUT OPERATIONS. PCC EDGE SHALL BE PROTECTED DURING OPERATIONS TO PREVENT DAMAGE OR SPALLING. DAMAGED ITEMS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY

5. THERMOPLASTIC COAL TAR SEALER TO BE APPLIED ON PCC AREAS SHOWN. 1

6. ADDITIONAL AREAS, NOT SHOWN, WILL BE COMPLETED ON RUNWAY 8L-26R. THE CONSTRUCTION MANAGER WILL IDENTIFY LOCATIONS.

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

THERMOPLASTIC COAL TAR EMULSION SEALCOAT APPLICATION PLAN 1

WBS NUMBER: D.02.20.043	DRAWN BY: JDR
FC NUMBER: FC-7757	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: JDR

APPROVED BY
JDR

DATE: 10/6/14

SCALE:
1"=400'

SHEET NO:

C.1.3

NOT RELEASED FOR CONSTRUCTION

NOTES:

1. TAXIWAY JULIETT PAVEMENT RECONSTRUCTION SHALL BE COMPLETED WITHIN 6 DAYS INCLUDING STRIPING AND ELECTRICAL WORK.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING TAXILANE DIXIE CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. CONSTRUCTION MUST OCCUR BETWEEN THE HOURS OF 2230-0630. OPENING TIME FOR TAXIWAY MIKE WILL BE 0630. NO DAYTIME CONSTRUCTION WILL BE PERMITTED AT THIS LOCATION.

TRAFFIC CONTROL LEGEND

- (A) LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE
- PROPOSED SIGN
- JERSEY BARRIER
- STRIPING REMOVAL
- TEMPORARY PAVEMENT



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport

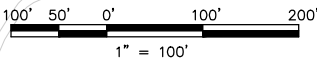


1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015
TAXIWAY JULIETT PAVEMENT
RECONSTRUCTION
PHASING PLAN

ISSUED FOR BID

WBS NUMBER: D.02.20.043	DRAWN BY: JDR
FC NUMBER: FC-7757	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: 1"=100'
	SHEET NO: G.4.7



AIRFIELD REPAIR 2015

NOT RELEASED FOR CONSTRUCTION

NOTES:

1. CONSTRUCTION SHALL BE COMPLETED WITHIN 14 DAYS INCLUDING STRIPING AND ELECTRICAL WORK. ONCE CONSTRUCTION COMMENCES, IT SHALL CONTINUE 24 HOURS A DAY, 7 DAYS A WEEK UNTIL THE AREA IS COMPLETED AND REOPENED.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. TAXIWAYS A7, A11, A13 AND NORTH CARGO RAMP SHALL REMAIN OPEN DURING ALL TIMES.

TRAFFIC CONTROL LEGEND

- (A) LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE
- PROPOSED SIGN
- JERSEY BARRIER
- STRIPING REMOVAL
- TEMPORARY PAVEMENT



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1	10/30/14	JDR			ADDENDUM 1
NO.	DATE	BY			REVISION

AIRFIELD REPAIR 2015
NLVR PAVEMENT
RECONSTRUCTION
PHASE 2 DETOUR
SIGNAGE PLAN

ISSUED FOR BID

WBS NUMBER: D.02.20.043	DRAWN BY: JDR
FC NUMBER: FC-7757	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: 1"=200'
	SHEET NO:

G.4.6.4

NOT RELEASED FOR CONSTRUCTION

AIRFIELD REPAIR 2015

NOTES:

1. CONSTRUCTION SHALL BE COMPLETED WITHIN 14 DAYS INCLUDING STRIPING AND ELECTRICAL WORK. ONCE CONSTRUCTION COMMENCES, IT SHALL CONTINUE 24 HOURS A DAY, 7 DAYS A WEEK UNTIL THE AREA IS COMPLETED AND REOPENED.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES. SEE SHEET G.4.6.4 FOR ADDITIONAL SIGNAGE.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. TAXIWAYS A7, A11, A13 AND NORTH CARGO RAMP SHALL REMAIN OPEN DURING ALL TIMES.

TRAFFIC CONTROL LEGEND

- (A) LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE
- PROPOSED SIGN
- JERSEY BARRIER
- STRIPING REMOVAL
- TEMPORARY PAVEMENT



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport



AIRFIELD REPAIR 2015
NLVR PAVEMENT
RECONSTRUCTION
TW A13 TO F.S. 24
PHASE 2 DETOUR PLAN

ISSUED FOR BID

WBS NUMBER:
D.02.20.043

FC NUMBER:
FC-7757

CONSULTANT PROJECT NUMBER:

DRAWN BY:
JDR

DESIGNED BY:
JDR

CHECKED BY:
RFM

APPROVED BY:
RFM

DATE:
10/6/14

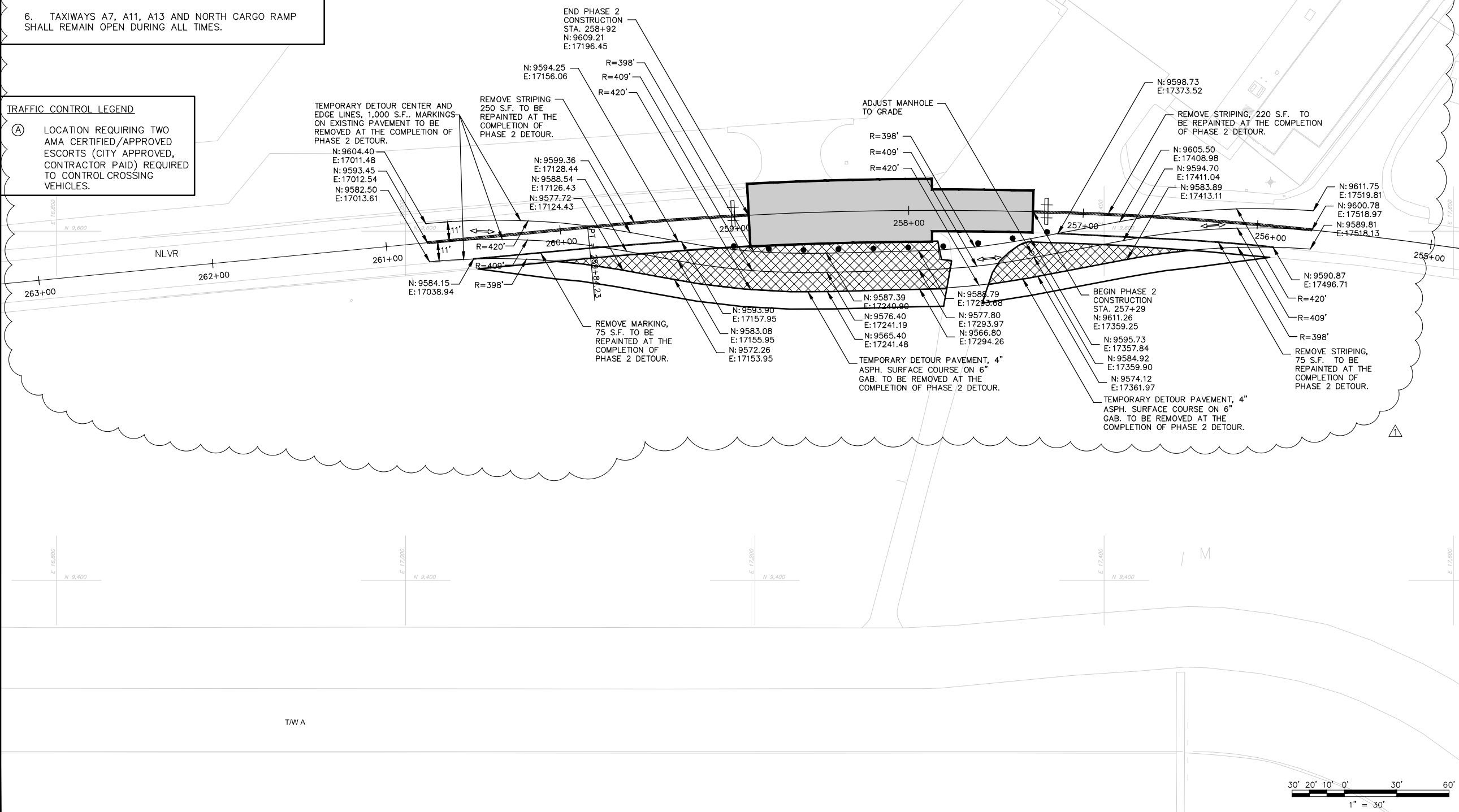
SCALE:
1"=30'

SHEET NO:

G.4.6.3

NOT RELEASED FOR CONSTRUCTION

AIRFIELD REPAIR 2015



NOTES:

1. CONSTRUCTION SHALL BE COMPLETED WITHIN 14 DAYS INCLUDING STRIPING AND ELECTRICAL WORK. ONCE CONSTRUCTION COMMENCES, IT SHALL CONTINUE 24 HOURS A DAY, 7 DAYS A WEEK UNTIL THE AREA IS COMPLETED AND REOPENED.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. TAXIWAYS A7, A11, AND NORTH CARGO RAMP SHALL REMAIN OPEN DURING ALL TIMES.

TRAFFIC CONTROL LEGEND

- (A) LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

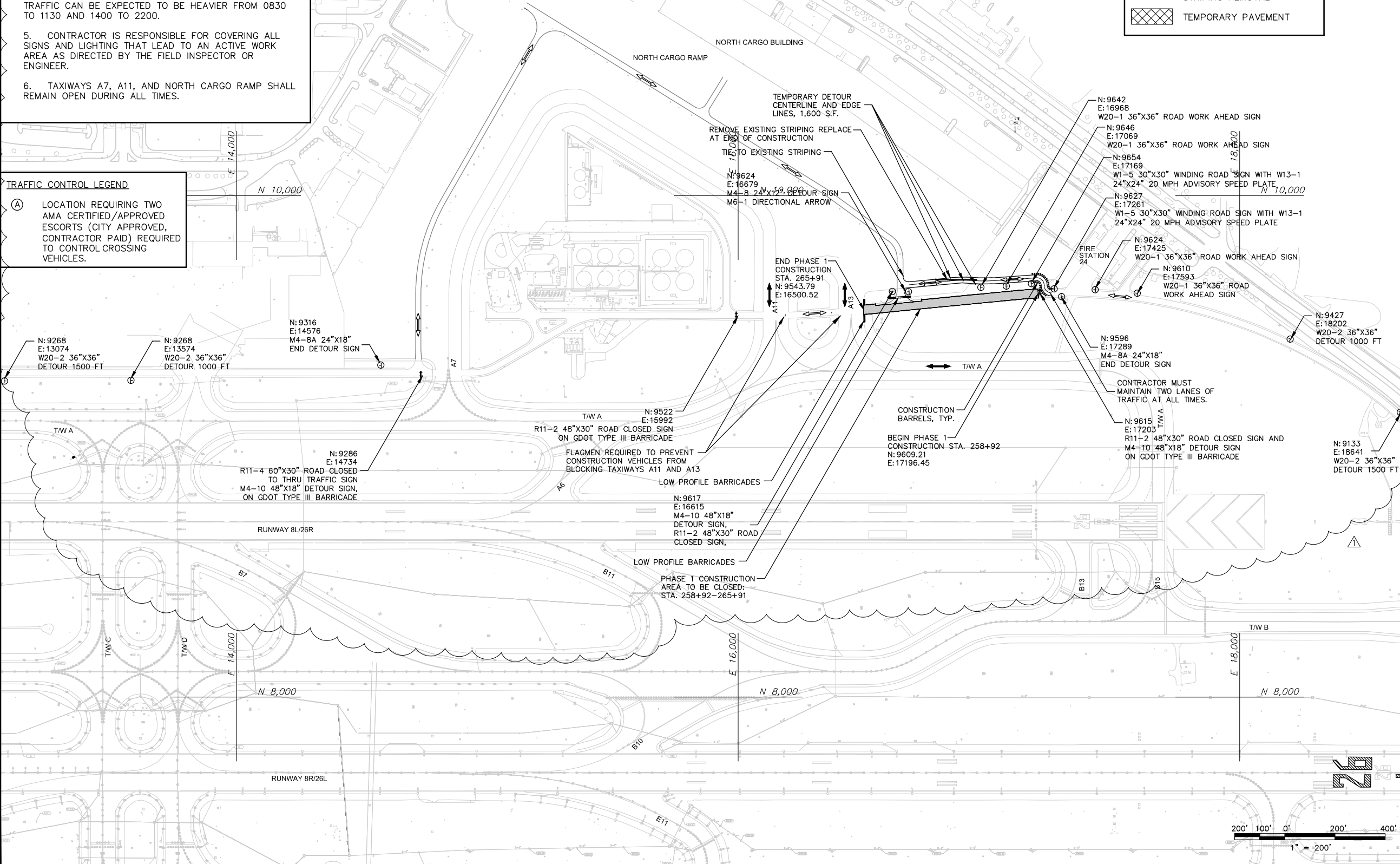
LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE
- PROPOSED SIGN
- JERSEY BARRIER
- STRIPING REMOVAL
- TEMPORARY PAVEMENT



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport



1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015
NLVR PAVEMENT
RECONSTRUCTION
PHASE 1 DETOUR
SIGNAGE PLAN

ISSUED FOR BID

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	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: 1"=200'
	SHEET NO: G.4.6.2

AIRFIELD REPAIR 2015

NOT RELEASED FOR CONSTRUCTION

NOTES:

1. CONSTRUCTION SHALL BE COMPLETED WITHIN 14 DAYS INCLUDING STRIPING AND ELECTRICAL WORK. ONCE CONSTRUCTION COMMENCES, IT SHALL CONTINUE 24 HOURS A DAY, 7 DAYS A WEEK UNTIL THE AREA IS COMPLETED AND REOPENED.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES. SEE SHEET G.4.6.2 FOR ADDITIONAL SIGNAGE.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. TAXIWAYS A7, A11, AND NORTH CARGO RAMP SHALL REMAIN OPEN DURING ALL TIMES. TAXIWAY A13 MAY BE CLOSED FOR ONE 72-HOUR CLOSURE TO FACILITATE WORK WITHIN 138' OF THE A13 CENTERLINE.

TRAFFIC CONTROL LEGEND

- (A) LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

REMOVE STRIPING, 50 S.F. TO BE REPAINTED AT COMPLETION OF PHASE 1 DETOUR.

PROPOSED STOP BAR SEE SHEET C.9.1. TO BE REMOVED AT COMPLETION OF PHASE 1 DETOUR.

END PHASE 1 CONSTRUCTION STA. 265+91
N: 9543.79
E: 16500.52

CONSTRUCTION WITHIN 138' OF THE TAXIWAY A13 CENTERLINE MUST BE PERFORMED DURING THE 72-HOUR CLOSURE OF TAXIWAY A13.

NORTH CARGO RAMP

LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE
- PROPOSED SIGN
- JERSEY BARRIER
- STRIPING REMOVAL
- TEMPORARY PAVEMENT



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport



NO.	DATE	BY	REVISION
1	10/30/14	JDR	ADDENDUM 1

AIRFIELD REPAIR 2015
NLVR PAVEMENT
RECONSTRUCTION
TW A13 TO F.S. 24
PHASE 1 DETOUR PLAN

ISSUED FOR BID

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APPROVED BY:
RFM

DATE:
10/6/14

SCALE:
1"=30'

SHEET NO:

G.4.6.1

30' 20' 10' 0' 30' 60'
1" = 30'

TW A

NOT RELEASED FOR CONSTRUCTION

AIRFIELD REPAIR 2015

1. CONSTRUCTION SHALL BE COMPLETED WITHIN 5 DAYS INCLUDING STRIPING WORK. ONCE CONSTRUCTION COMMENCES, WORK SHALL CONTINUE 24 HOURS A DAY UNTIL THE AREA IS COMPLETED AND REOPENED
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
4. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
5. TAXIWAY LIMA AND RAMP 4 SOUTH TAXILANES SHALL REMAIN OPEN DURING DAYTIME OPERATIONS, 0630-2330.
6. CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN TO ENGINEER AND RECEIVE APPROVAL PRIOR TO BEGINNING CONSTRUCTION.



Hartsfield-Jackson
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1	10/30/14	JDR	ADDENDUM 1	
NO.	DATE	BY	REVISION	

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	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: 1"=30'
	SHEET NO:

G.4.5

NOTES:

1. TAXILANE DIXIE VOID REPAIR SHALL BE COMPLETED WITHIN 14 DAYS INCLUDING STRIPING AND ELECTRICAL WORK. ONCE CONSTRUCTION COMMENCES, IT SHALL CONTINUE 24 HOURS A DAY, 7 DAYS A WEEK UNTIL THE AREA IS COMPLETED AND REOPENED.
2. UTILIZING NIGHT TIME CLOSURES, THE CONTRACTOR MAY COMPLETE INITIAL SAW CUTS FOR DEMOLITION UP TO 48 HOURS PRIOR TO BEGINNING TAXILANE DIXIE CONSTRUCTION.
3. LOW PROFILE BARRICADES SHALL BE PLACED OUTSIDE OF THE GROUP VI TAXIWAY OFA UNLESS OTHERWISE NOTED. BARRICADES ARE REQUIRED FOR ALL TAXIWAY CLOSURES.
4. CONTRACTOR SHOULD BE ADVISED THAT AIRCRAFT TRAFFIC CAN BE EXPECTED TO BE HEAVIER FROM 0830 TO 1130 AND 1400 TO 2200.
5. CONTRACTOR IS RESPONSIBLE FOR COVERING ALL SIGNS AND LIGHTING THAT LEAD TO AN ACTIVE WORK AREA AS DIRECTED BY THE FIELD INSPECTOR OR ENGINEER.
6. CONTRACTOR SHALL REMOVE HAUL ROAD AT THE COMPLETION OF THE PHASE AND RESTORE GRASS.
7. TAXILANE DIXIE VOID REPAIR WORK MAY NOT BE PERFORMED CONCURRENTLY WITH TAXIWAY LIMA VOID REPAIR WORK.
8. RAMP 6 SOUTH SHALL REMAIN OPEN DURING DAYTIME OPERATIONS, 0630-2330.
9. CONTRACTOR TO COMPLETE WORK BY OCTOBER 15, 2015.

TRAFFIC CONTROL LEGEND

- Ⓐ LOCATION REQUIRING TWO AMA CERTIFIED/APPROVED ESCORTS (CITY APPROVED, CONTRACTOR PAID) REQUIRED TO CONTROL CROSSING VEHICLES.

LEGEND

- CONSTRUCTION ACTIVITY
- AIRCRAFT TRAFFIC
- ACCESS/HAUL ROAD TRAFFIC
- LOW PROFILE BARRICADE



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015

TAXILANE DIXIE VOID
AND PIPE REPAIR
PHASING PLAN

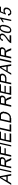
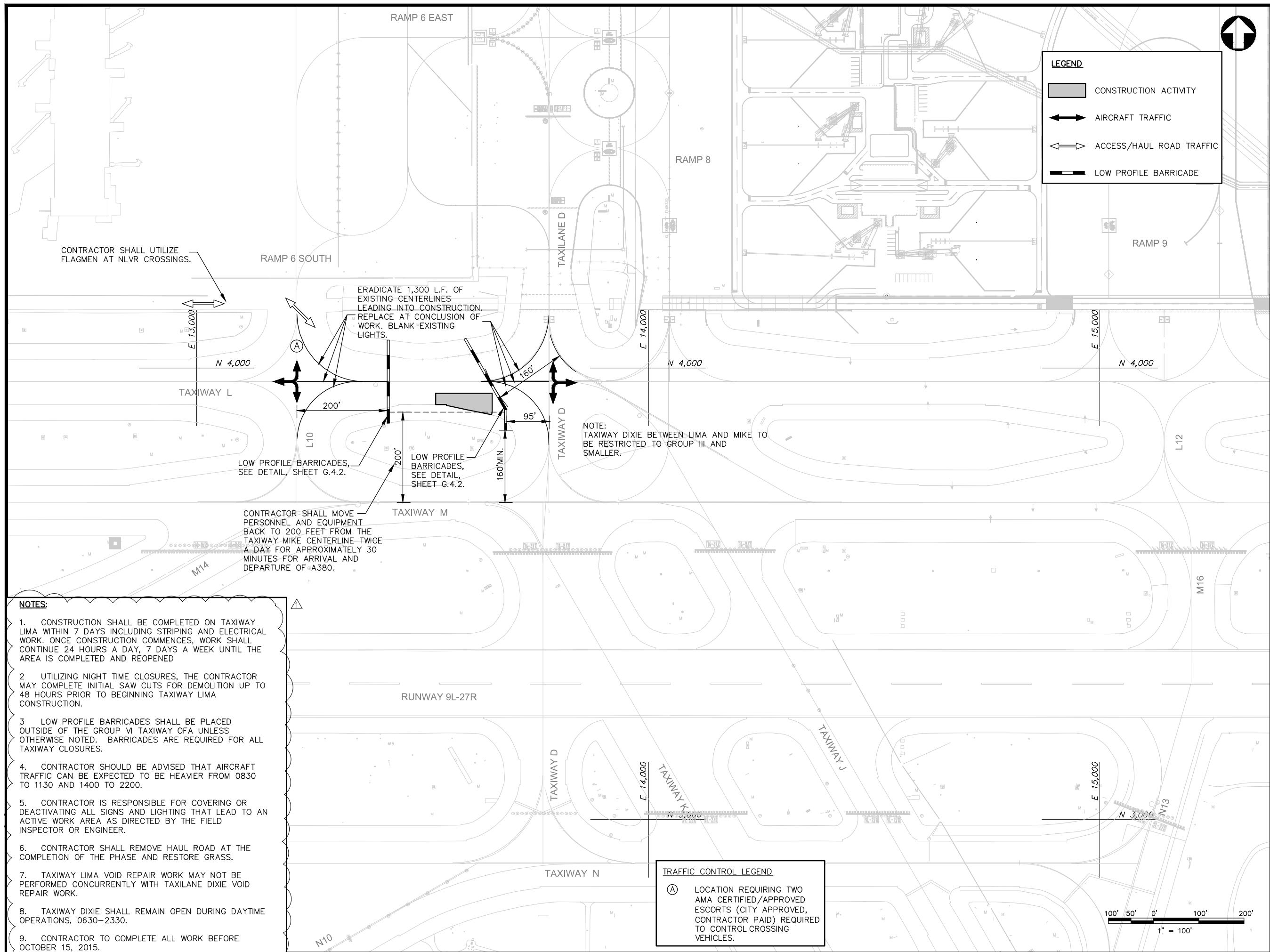
ISSUED FOR BID

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	APPROVED BY: RFM
	DATE:
	SCALE: 1"=100'
	SHEET NO:

G.4.4

AIRFIELD REPAIR 2015

NOT RELEASED FOR CONSTRUCTION

Hartsfield-Jackson
Atlanta International Airport

1	10/30/14	JDR	ADDENDUM 1	
NO.	DATE	BY	REVISION	

AIRFIELD REPAIR 2015

TAXIWAY LIMA VOID AND PIPE REPAIR PHASING PLAN

ISSUED FOR BID

WBS NUMBER:	DRAWN BY: JDR
FC NUMBER:	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE:
	SCALE: 1"=100'
	SHEET NO:
G.4.3	

NOT RELEASED FOR CONSTRUCTION

CONSTRUCTION SAFETY PHASING PLAN GENERAL NOTES:

THIS CONSTRUCTION SAFETY PHASING PLAN (CSPP), AS REQUIRED BY FAA ADVISORY CIRCULAR 150/5370-2F, STIPULATES RESPONSIBILITIES TO MAINTAIN OPERATIONAL SAFETY ON THE AIRPORT DURING CONSTRUCTION. ALL CONSTRUCTION OPERATIONS EXECUTED DURING THIS CONSTRUCTION PROJECT SHALL CONFORM TO THIS PLAN. INCLUDED IN THE CSPP, THE CONTRACTOR IS REQUIRED TO SUBMIT A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) TO THE AIRPORT FOR APPROVAL TO BE ISSUED PRIOR TO THE NOTICE-TO-PROCEED (NTP). THE CONTRACTOR WILL DEFINE IN THE SPCD DETAILS HOW THEY WILL ABIDE WITH THE REQUIREMENTS PLACED IN THE CSPP. THE SPCD IS A SUBSET OF THE CSPP, SIMILARLY HOW THE SHOP DRAWING REVIEW IS A SUBSET TO THE TECHNICAL SPECIFICATIONS. SCOPE OF WORK:

THIS PROJECT CONSISTS OF (1) RUNWAY AND TAXIWAY REPAIRS: SPALL REPAIR, JOINT SEALING, CRACK SEALING (2) TAXIWAY FULL DEPTH CONCRETE REPLACEMENT (3) TAXIWAY PAVEMENT RECONSTRUCTION (4) TRENCH DRAIN REPAIRS (5) TAXIWAY SHOULDER MARKINGS (6) ASPHALT SHOULDER REJUVENATOR (7) SLOPE PAVING REPAIR AND (8) NLVR PAVEMENT RECONSTRUCTION.

1. COORDINATION:

COORDINATION MEETINGS ARE HELD THROUGHOUT DESIGN, CONTRACT PROCUREMENT, AND DURING CONSTRUCTION. OPERATIONAL SAFETY IS A STANDING AGENDA TOPIC DURING EVERY PHASE OF THE PROJECT.

A. **CONTRACTOR PROGRESS MEETINGS** – AIRPORT OPERATORS AND/OR TENANTS IMPACTED DURING CONSTRUCTION HAVE OR WILL HAVE THE OPPORTUNITY TO POSE QUESTIONS AT STAKEHOLDER, PRE-BID, AND PRE-CONSTRUCTION MEETINGS. IN ADDITION, CONSTRUCTION PROGRESS MEETINGS, SCOPE OR SCHEDULE CHANGES, AND MEETINGS WITH THE FAA AIR TRAFFIC ORGANIZATION (ATO) WILL BE HELD AS REQUIRED THROUGH THE PERFORMANCE OF THE CONTRACT.

- STAKEHOLDER MEETINGS SHALL BE CONDUCTED TO ENSURE THE SPONSOR, ENGINEER, CONTRACTOR, AND OTHER INTERESTED PARTIES ARE AWARE OF THE PROJECT REQUIREMENTS AND HAVE AN UNDERSTANDING OF THEIR INDIVIDUAL RESPONSIBILITIES, AS WELL AS THE TECHNICAL REQUIREMENTS OF THE CONTRACT.
- THE CITY OF ATLANTA (CITY) WILL CONDUCT A PRE-BID CONFERENCE FOR THIS PROJECT. INCLUDED IN THIS CONFERENCE WILL BE A DISCUSSION HELD BY THE ENGINEER TO CLARIFY AND EXPLAIN CONSTRUCTION METHODS, PROCEDURES, AND SAFETY MEASURES REQUIRED BY THE CONTRACT. THE PARTICIPANTS NORMALLY INCLUDE PROSPECTIVE BIDDERS, SUBCONTRACTORS, AND MATERIAL SUPPLIERS.
- PRE-CONSTRUCTION CONFERENCE WILL BE HELD WITH THE CONTRACTOR IMMEDIATELY FOLLOWING NTP. A PRE-ACTIVITY MEETING WILL BE HELD PRIOR TO THE START OF EACH CONSTRUCTION ACTIVITY. MEETING ATTENDEES SHALL INCLUDE: AIRSIDE OPERATIONS, LOCAL AIR TRAFFIC CONTROL MANAGEMENT, LOCAL FAA REPRESENTATIVES, DESIGN ENGINEER, CONTRACTOR PERSONNEL, CONSTRUCTION MANAGEMENT STAFF, AIRLINE REPRESENTATIVES, AND OTHER STAKEHOLDERS. THIS PLAN, ALONG WITH THE SPCD, WILL BE REVIEWED AT THE MEETING.
- UPON NTP, WEEKLY CONTRACTOR PROGRESS MEETINGS WILL BE HELD THROUGHOUT THE DURATION OF THE PROJECT. AT A MINIMUM, ATTENDEES WILL INCLUDE CONTRACTOR PERSONNEL, CONSTRUCTION MANAGEMENT STAFF, AND AIRSIDE OPERATIONS. OPERATIONAL SAFETY SHALL BE A STANDING AGENDA ITEM FOR DISCUSSION.

B. **SCOPE OR SCHEDULE CHANGES** – ANY SCOPE AND SCHEDULE CHANGES WILL BE DOCUMENTED BY THE PROJECT CONSTRUCTION MANAGER AND ADDRESSED IN WEEKLY PROGRESS MEETINGS. ANY CHANGES TO THE CSPP WILL REQUIRE DEPARTMENT OF AVIATION (DOA) AND FAA APPROVAL.

C. **FAA ATO COORDINATION** – POTENTIAL IMPACTS TO NAVIGATIONAL AIDS (NAVAIDS) OR CHANGES TO GRADES SHALL REQUIRE EARLY COORDINATION WITH FAA. STAKEHOLDER MEETINGS SHALL BE SCHEDULED AS NEEDED TO IDENTIFY AND ADDRESS ANY OPERATIONAL IMPACTS. NO IMPACTS TO NAVAIDS ARE ANTICIPATED DURING CONSTRUCTION OF THIS PROJECT.

FAA REGULATIONS FOR THE USE OF CRANES AND OTHER ELEVATED EQUIPMENT WILL BE STRICTLY ENFORCED. FAA APPROVAL WILL BE REQUIRED PRIOR TO THE CONTRACTOR'S USE OF ANY ELEVATED EQUIPMENT. A MINIMUM OF 60 DAYS WILL BE REQUIRED FOR FAA APPROVAL OF FORM(S) 7460 – 1. THIS 60-DAY PERIOD BEGINS THE DATE DOA SUBMITS THE 7460 – 1 TO THE FAA.

2. PHASING:

A. **PHASE ELEMENTS** – SPECIFIC ACTIVITIES WILL BE COMPLETED INDEPENDENTLY OF EACH OTHER WITH A SEPARATE TAXIWAY/RUNWAY CLOSURE.

- ALL RUNWAY/TAXIWAY CLOSURES WILL REQUIRE COORDINATION AND APPROVAL FROM AIRSIDE OPERATIONS AT LEAST 48-HOURS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. FAILURE TO REQUEST CLOSURE AT LEAST 48-HOURS IN ADVANCED MAY RESULT IN WORK BEING CANCELLED AT NO COST TO THE CITY. THE RUNWAY/TAXIWAY CONSTRUCTION CONTROL PLAN (REFER TO SHEET G.4.1) SHOWS AREAS THAT REQUIRE SPECIFIC COORDINATION PRIOR TO CLOSING, SINCE THESE ARE AREAS THAT ARE PRIMARY ROUTES THAT MUST REMAIN OPEN TO MAINTAIN AIRCRAFT TRAFFIC.
- CLOSURE REQUESTS SHALL BE MADE THROUGH THE CONSTRUCTION MANAGER TO AIRSIDE OPERATIONS. AIRSIDE OPERATIONS SHALL COORDINATE APPROVAL AND ALTERNATIVE TRAFFIC ROUTES WITH THE FAA. SOME PRIMARY ROUTES MAY NOT BE CLOSED SIMULTANEOUSLY TO ENSURE CONTINUED TRAFFIC. TAXIWAY CLOSURE BOUNDARIES SHALL BE LIMITED BY THE SCOPE OF WORK TO BE ACCOMPLISHED DURING A CLOSURE PERIOD. CONTRACTOR SHOULD ANTICIPATE NO MORE THAN ONE TAXIWAY CLOSURE PER COMPLEX AT A TIME. REQUESTS FOR ADDITIONAL TAXIWAY CLOSURES SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.
- THE CONTRACTOR SHALL SCHEDULE ITS OPERATION TO COMPLETE ALL WORK WITHIN THE SPECIFIED TIME PERIODS AND SHALL HAVE SUFFICIENT LABOR, MATERIALS, AND EQUIPMENT ON HAND TO ACCOMPLISH THIS.
- THE INTENT OF CLOSURES IS TO PROVIDE THE CONTRACTOR SUFFICIENT WORK AREAS TO COMPLETE THE WORK WITHIN THE TIME PERIODS SPECIFIED AND TO ADEQUATELY MAINTAIN AIRCRAFT OPERATIONS. THE CONTRACTOR WILL BE ALLOWED ACCESS TO ONLY THE PORTIONS OF THE RUNWAY OR TAXIWAY CLOSURE AREA THAT CAN BE COMPLETED DURING THE CLOSURE TIME FRAME.
- CONTRACT DURATION IS 400 DAYS. WORK ON TAXIWAYS AND RUNWAYS WILL BE ACCOMPLISHED FROM 2330 – 0630 NIGHTLY UNLESS NOTED OTHERWISE. NIGHTLY CLOSURES WITH MULTIPLE TAXIWAY AND RUNWAY WILL BE STAGGERED IN 15 MINUTE INCREMENTS STARTING AT 2330 AND OPENINGS WILL NEED TO BE STAGGERED SO THE LAST RE-OPENING OCCURS AT 0630. REFER TO PHASE NOTES FOR DURATION AND HOURS ON THE CONSTRUCTION PHASING PLAN DRAWINGS G.4.3–G.4.7. THE ORDER OF THE PHASES IS AT THE DIRECTION OF THE OWNER.
- AIRFIELD AREAS SCHEDULED FOR CLOSURE FOR CONSTRUCTION ACTIVITIES WILL NOT BE CLOSED UNTIL ALL PERSONNEL, EQUIPMENT, AND MATERIALS ARE STAGED AND READY TO MOVE INTO THE WORK AREA.
- AIRPORT RESCUE AND FIRE FIGHTING (ARFF) ACCESS ROUTES AND ROUTES USED BY SUPPORT VEHICLES WILL NOT BE AFFECTED BY THIS CONSTRUCTION. IF ANY ACTIVITY HAS THE POTENTIAL TO IMPACT AN ACCESS ROUTE, ALL AFFECTED AGENCIES WILL BE NOTIFIED.
- REFER TO SHEET G.3.1–G.3.2. FOR CONSTRUCTION STAGING AREA AND HAUL ROUTES. STAGING AREA INCLUDES MATERIAL STORAGE AREA, EQUIPMENT STAGING, AND PARKING. CONSTRUCTION ACCESS TO THE PROJECT SITE SHALL BE THROUGH THE INDICATED ACCESS GATES.
- DURING ALL PHASES OF OPERATION THE CONTRACTOR'S FIRST RESPONSIBILITY SHALL BE

SAFETY. THUS, THE CONTRACTOR SHALL BE REQUIRED TO KEEP THE ROADWAYS, TAXIWAYS, AND APRONS FREE OF ALL EQUIPMENT, DEBRIS AND WASTE PRODUCTS EXCEPT FOR THOSE EXCLUSIVELY REQUIRED IN THE CONTRACTOR'S WORK AREA. AS AN ADDED MEASURE OF SAFETY, THE CONTRACTOR SHALL MAINTAIN ACCESS TO VACUUM SWEEPERS, WATERING TRUCKS AND OTHER EQUIPMENT NECESSARY TO CONTROL DUST AT ALL TIMES ON THE PROJECT. DUST CONTROL SHALL BE STRICTLY MONITORED DUE TO ITS IMPACT ON AIRCRAFT SAFETY, FAILURE TO PROPERLY CONTROL DUST OR TO RESPOND TO ANY REQUEST TO DO SO WILL RESULT IN CONSTRUCTION ACTIVITIES BEING STOPPED AT NO COST TO THE CITY.

B. **CONSTRUCTION SAFETY DRAWINGS** – REFER TO SHEETS G.3.1–G.3.2 AND G.4.1 FOR TRAFFIC CONTROL, SCHEDULING CLOSURES FOR CONSTRUCTION, NAVAID CRITICAL AREAS, HAUL ROUTES, AND REQUIRED HAZARD MARKING AND LIGHTING.

3. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION ACTIVITIES:

RUNWAYS AND TAXIWAYS SHALL REMAIN IN USE BY AIRCRAFT TO THE MAXIMUM EXTENT POSSIBLE WITHOUT COMPROMISING SAFETY. PRE-MEETINGS WITH THE FAA ATO WILL ADDRESS OPERATIONAL AFFECTS.

A. **IDENTIFICATION OF AFFECTED AREAS** – THIS PROJECT WILL REQUIRE LIMITING CERTAIN AIRCRAFT OPERATIONS ON THE RUNWAY AND TAXIWAY BY RESTRICTING THE USABLE AREA. IMPACTS WILL VARY BASED ON NORMAL OPERATIONS OF AN AREA, CONSTRUCTION PHASE, AND DURATION OF WORK.

B. **MITIGATION OF EFFECTS** – TEMPORARY CHANGES TO RUNWAY AND/OR TAXI OPERATIONS; MAINTENANCE OF ESSENTIAL UTILITIES; TEMPORARY CHANGES TO AIR TRAFFIC CONTROL PROCEDURES.

4. PROTECTION OF NAVAIDS:

BEFORE COMMENCING CONSTRUCTION ACTIVITY, PARKING VEHICLES, OR STORING CONSTRUCTION EQUIPMENT AND MATERIALS NEAR A NAVAID, THE CONTRACTOR SHALL COORDINATE WITH AIRPORT ENGINEERING AND OPERATIONS WHO WILL COORDINATE TO EVALUATE THE EFFECT OF CONSTRUCTION ACTIVITY, AND DETERMINE THE REQUIRED DISTANCES AND DIRECTION FROM THE NAVAID. REFER TO SHEET G.4.1 FOR NAVAID CRITICAL AREAS. CONTRACTOR PERSONNEL SHALL BE AWARE OF CRITICAL AREA LOCATIONS AND REMAIN CLEAR OF THE AREAS DURING LOW VISIBILITY. NO MATERIAL OR CONSTRUCTION WILL BE STOCKPILED OR STORED NEAR ANY NAVAIDS.

5. CONTRACTOR ACCESS:

A. **LOCATION OF STOCKPILED CONSTRUCTION MATERIALS** – THE EXACT LIMITS OF THE CONTRACTOR'S STAGING AREA FOR MATERIAL STOCKPILING, LAYDOWN, AND OFFICE TRAILERS SHALL BE ESTABLISHED BY THE CONTRACTOR WITH THE APPROVAL OF THE CONSTRUCTION MANAGER IN THE AREA SHOWN. THE PUBLIC ACCESS AREAS SHALL BE ENCLOSED BY TEMPORARY SECURITY FENCING ACCEPTABLE TO THE CITY. ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S STAGING AREA SHALL BE ARRANGED AND PROMPTLY PAID FOR BY THE CONTRACTOR DIRECTLY WITH THE APPROPRIATE UTILITY AGENCY. UTILITY ARRANGEMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE CITY. THE CONTRACTOR SHALL RESTORE THE SITE TO A CONDITION THAT IS CLEAN AND FREE OF DEBRIS WITH A GRAVEL SURFACE AND FENCE INTACT UPON COMPLETION OF THE PROJECT. THE CONTRACTOR MAY SET UP A CONCRETE BATCH PLANT IN THE STAGING AREA WITH THE APPROVAL OF THE CITY. ADDITIONALLY, THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION UPON COMPLETION OF THE PROJECT.

B. **VEHICLE AND PEDESTRIAN OPERATIONS** – THE CONTRACTOR'S ACCESS ROUTES TO THE PROJECT SITES SHALL BE VIA SECURITY GATE 69 AND THE NON-LICENSED VEHICLE ROAD (NLVR), UNLESS OTHERWISE COORDINATED WITH THE CONSTRUCTION MANAGER. THE CONTRACTOR MAY OPEN THE GATE TO ALLOW THE EQUIPMENT AND VEHICLES TO PASS THROUGH INTO THE AIRCRAFT OPERATING AREA (AOA), PROVIDED THE VEHICLES HAVE PASSES AND THE CONTRACTOR'S REPRESENTATIVE HAS A VALID SECURITY BADGE.

THE CONTRACTOR'S ACCESS ROUTE TO THE PROJECT SITE AND HAUL ROUTE ARE SHOWN ON SHEETS G.3.1 AND G.4.1 CONSTRUCTION CONTROL PLAN. THE HAUL ROUTE IS FOR USE BY MULTIPLE CONTRACTORS. ALL HAUL ROADS REQUIRED BY THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND ANY ASSOCIATED COST SHALL BE INCLUDED IN THE GENERAL COST OF THE WORK. THE CONTRACTOR SHALL REPAIR ANY AND ALL HAUL ROUTES DAMAGED BY HIS OR HER CONSTRUCTION/HAULING ACTIVITIES AT NO COST TO THE OWNER. USE OF UNAUTHORIZED HAUL ROUTES SHALL NOT BE PERMITTED. ROADS USED BY THE CONTRACTOR FOR ACCESS OR HAULING SHALL BE KEPT CLEAN AND ACCESSIBLE TO ALL OTHER AIRPORT TRAFFIC FOR THE ENTIRE DURATION OF THE PROJECT. NO SEPARATE PAYMENT SHALL BE MADE FOR KEEPING THE ROADS CLEAR AND ACCESSIBLE.

HAUL TRUCKS MUST BE COVERED AND ANY SPILLAGE OR DEBRIS BUILDUP PROMPTLY REMOVED FROM ALL HAUL ROUTES ON AIRPORT OR ON PUBLIC ROADS.

WHEN MOVING EQUIPMENT ACROSS ACTIVE TAXIWAYS AND TAXILANES IS REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PRIOR APPROVAL FROM AIRSIDE OPERATIONS AND USE AIRCRAFT MOVEMENT AREA (AMA) CROSSING GUARDS OR ESCORTS. FOR EACH ACTIVE TAXIWAY AND TAXILANE CROSSING, THE CONTRACTOR SHALL PROVIDE AN OPERATOR WITH A VACUUM SWEEPER CONSTANTLY KEEPING THE CROSSING FREE FROM DUST AND DEBRIS.

C. **MECHANISMS TO PREVENT IMPROPER MOVEMENT:** CONTRACTOR OPERATIONS WITHIN THE SECURITY IDENTIFICATION DISPLAY AREA (SIDA) OR AOA ARE LIMITED TO THE WORK AREAS SHOWN ON THE PLANS. A VISUAL DELINEATION WILL BE PROVIDED BY THE CONTRACTOR BETWEEN THE WORK AREAS AND THE RUNWAY SAFETY AREA AND TAXIWAY OBJECT FREE AREA WHEN DIRECTLY ADJACENT TO ONE ANOTHER. THE PLANS SHOW LOCATIONS OF WORK AREA BOUNDARIES, WHICH GENERALLY FOLLOW OBJECT FREE AREAS OF ADJACENT OPEN PAVEMENT. CONSTRUCTION VEHICLES AND PERSONNEL MUST NOT CROSS BARRICADES OR OTHER VISUAL IDENTIFIERS AT ANY TIME WITHOUT AN ESCORT FROM AIRSIDE OPERATIONS PERSONNEL OR APPROVAL FROM GROUND CONTROL.

D. **PARKING AREAS FOR PERSONAL VEHICLES AND EQUIPMENT:** CONTRACTOR EMPLOYEE PERSONAL VEHICLES MAY NOT BE PARKED OR DRIVEN IN THE SIDA OR AOA. EMPLOYEE PARKING AREAS ARE IDENTIFIED ON THE PLANS.

CONTRACTOR VEHICLES AND EQUIPMENT ARE ALLOWED INSIDE OF THE PROJECT WORK AREA WITHIN THE SIDA WHERE APPROVED BY THE AIRPORT FOR EACH PHASE. EQUIPMENT STAGING AND PARKING AREAS ARE AS SHOWN IN THE PLANS. NO NON-ACTIVE CONTRACTOR EQUIPMENT IS PERMITTED WITHIN AN ACTIVE RUNWAY OBJECT FREE AREA (400–FT FROM CENTERLINE) OR TAXIWAY OBJECT FREE AREA (160–FT FROM CENTERLINE).

E. **CONTRACTOR VEHICLE MARKING AND LIGHTING:** EACH CONTRACTOR LICENSED VEHICLE MUST MEET THE REQUIREMENTS OF THE AIRPORT SECURITY OFFICE REQUIREMENTS. IN ADDITION, MARKING AND LIGHTING OF VEHICLES SHALL BE IN ACCORDANCE WITH FAA AC 150/5210-5D – PAINTING, MARKING AND LIGHTING OF VEHICLES USED ON AIRPORTS.

F. **DRIVING, TRAINING, AND SITUATIONAL AWARENESS:** THE FOLLOWING RULES OF OPERATION MUST BE FOLLOWED AT ALL TIMES WHEN DRIVING ON THE AIRPORT:

- CONTRACTOR SHALL TRAIN ALL PERSONNEL DRIVING ON THE AIRPORT AND SHALL MAKE THEM AWARE OF AIRPORT PROCEDURES, SAFETY, RISKS, AND THE FACT THAT **AIRCRAFT ALWAYS HAVE THE RIGHT-OF-WAY**. CONTRACTOR SHALL REFER TO AC 150/5210-20 – GROUND VEHICLE OPERATIONS ON AIRPORTS, FOR MORE INFORMATION.
- NO PERSON SHALL OPERATE MOTORIZED VEHICLES OR EQUIPMENT OF ANY KIND ON THE AIRPORT UNLESS IN POSSESSION OF VALID OPERATOR'S LICENSE FOR THE TYPE OF VEHICLE BEING OPERATED.
- NO PERSON SHALL OPERATE A MOTORIZED VEHICLE WITHIN THE SIDA UNLESS THEY HAVE A "D" DESIGNATION ON THEIR SIDA BADGE OR THEY ARE BEING ESCORTED BY AN AIRPORT APPROVED ESCORT. TO OBTAIN A "D" DESIGNATION, PERSONNEL MUST TAKE AND PASS THE AIRSIDE OPERATIONS DRIVER'S TRAINING COURSE.
- NO PERSON SHALL OPERATE A MOTOR VEHICLE OR OTHER MOTORIZED EQUIPMENT OF ANY

KIND ON THE AIRPORT IN A RECKLESS OR NEGLIGENT MANNER OR WITHOUT CAUTION OR IN ANY MANNER THAT ENDANGERS OR IS LIKELY TO ENDANGER PERSONS OR PROPERTY, OR IN EXCESS OF THE POSTED SPEED LIMIT.

5) ALL VEHICLES AND PEDESTRIANS SHALL GIVE RIGHT-OF-WAY TO AIRCRAFT TRAFFIC, **NO EXCEPTIONS**. ALL GROUND VEHICLES SHALL PASS TO THE **REAR** OF TAXIING AIRCRAFT AFTER ACCOUNTING FOR POSSIBLE JET BLAST EFFECTS.

6) NO PERSON UNDER THE INFLUENCE OF ALCOHOL OR DRUGS SHALL OPERATE A MOTOR VEHICLE ON THE AIRPORT.

7) CONTRACTOR WILL NOT BE ALLOWED TO OPERATE MOTOR VEHICLES OUTSIDE OF THE DESIGNATED WORK AREAS AS IDENTIFIED BY BARRICADES INCLUSIVE OF THE APPROVED CONTRACTOR HAUL ROUTE. NO CROSSING OF A ZIPPER LINE IS PERMITTED WITH THE EXCEPTION OF A DESIGNATED HAUL ROUTE. NO CROSSING OF ACTIVE TAXIWAYS IS PERMITTED WITH THE EXCEPTION OF A CROSSING THAT INCLUDES A FLAGMAN OR ESCORT VEHICLE THAT HAS RADIO CONTACT WITH THE AIR TRAFFIC CONTROL TOWER. **ABSOLUTELY NO CROSSING OF ACTIVE RUNWAYS OR INCURSIONS INTO ACTIVE RUNWAY SAFETY AREAS IS PERMITTED.**

8) DRIVERS SHALL BE ESPECIALLY COGNIZANT AND AWARE WHILE DRIVING ON AIRPORT. VEHICLE DRIVERS MUST CONFIRM BY PERSONAL OBSERVATION THAT NO AIRCRAFT IS APPROACHING THEIR POSITION (EITHER IN THE AIR OR ON THE GROUND) WHEN GIVEN CLEARANCE TO CROSS A TAXIWAY, OR ANY OTHER AREA OPEN TO AIRSIDE OPERATIONS.

9) OTHER RESTRICTIONS AS DEFINED BY THE **ATL SECURITY AND SAFETY GUIDELINES** INCLUDED IN THE GENERAL PROVISIONS AND IN THE AIRSIDE OPERATIONS DRIVER'S TRAINING COURSE SHALL BE FOLLOWED.

G. **RADIO COMMUNICATIONS** – WHEN OPERATING VEHICLES ON OR NEAR OPEN RUNWAYS OR TAXIWAYS, ALL PARTIES MUST UNDERSTAND THE CRITICAL IMPORTANCE OF MAINTAINING RADIO CONTACT, AS DIRECTED BY AIRSIDE OPERATIONS DURING AMA DRIVER TRAINING. THE TRAINING PROVIDED BY AIRSIDE OPERATIONS ENCOMPASSES SITUATIONAL AWARENESS, FAMILIARIZATION, PROPER RADIO PHRASEOLOGY, AND FREQUENCIES. AIRSIDE OPERATIONS MAY DESIGNATE THE CONSTRUCTION MANAGEMENT INSPECTOR, AND IN ADDITION TO, AN AMA ESCORT OR CROSSING GUARD TO COMMUNICATE WITH THE FAA ATCT TO PROVIDE THE CONTRACTOR AND THEIR PERSONNEL WITH ESCORTS OR CROSSING POINTS ON THE AMA. THE INSPECTOR, AMA ESCORT, AND CROSSING GUARD SHALL COORDINATE WITH AIRSIDE OPERATIONS FOR APPROPRIATE FREQUENCIES TO BE USED.

H. **SECURITY** – ALL CONTRACTOR PERSONNEL INCLUDING SUBCONTRACTORS SHALL HAVE A CONTRACTOR PROVIDED PHOTO ID. ALL CONTRACTOR PERSONNEL AND SUBCONTRACTORS WORKING WITHIN THE SIDA/AOA SHALL HAVE AIRPORT SECURITY BADGES OR BE ESCORTED BY APPROVED CONTRACTOR BADGED ESCORT PERSONNEL. ALL PERSONNEL DRIVING ON THE AOA ARE REQUIRED TO PASS THE NECESSARY EXAMS AND DRIVER'S TEST AS SPECIFIED IN THE CONTRACT DOCUMENTS. SIDA INCLUDES ALL AREAS WITHIN THE AIRPORT SECURITY FENCE. THE AOA INCLUDES AREAS IN OR WITHIN CLOSE PROXIMITY TO AIRCRAFT MOVEMENT AREAS. SEE CONTRACT DOCUMENTS FOR BADGING REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BEING FAMILIAR WITH ALL REQUIREMENTS FOR ENTERING AND OPERATING IN THE AOA. ESCORT PERSONNEL SHALL BE APPROVED BY THE AIRPORT SECURITY OFFICE FOR WORKING WITHIN SIDA AND BY THE AIRSIDE OPERATIONS OFFICE FOR WORKING WITHIN THE AOA. EACH ESCORT VEHICLE IS ALLOWED TO ESCORT A MAXIMUM OF TWO VEHICLES. ALL ESCORT PERSONNEL SHALL HAVE AIRPORT BADGES. SEE CONTRACT DOCUMENTS FOR BADGING REQUIREMENTS.

ALL COST ASSOCIATED WITH ESTABLISHING AND MAINTAINING SIDA SECURITY, SECURITY GUARD POSTS, SECURITY GUARDS, AND SIDA ESCORTING SHALL BE INCLUDED IN THE PRICE BID FOR MOBILIZATION.

THE CONTRACTOR SHALL INSTALL A TEMPORARY SECURITY GUARD POST AT EXISTING GATES IN USE. AT NO TIME SHALL THE GATE BE UNLOCKED OR UNATTENDED. WHEN ACTIVELY IN USE, THIS SECURITY GUARD POST SHALL BE MANNED BY TWO UNIFORMED SECURITY GUARDS FURNISHED BY AND PAID FOR BY THE CONTRACTOR. THE GUARD'S DUTIES SHALL INCLUDE MONITORING TRAFFIC IN AND OUT OF THE SIDA AND PREVENTING UNAUTHORIZED PERSONNEL FROM ENTERING THE SECURE AREA. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE CITY WITH A SCHEDULE SHOWING THE NUMBER OF GUARDS AND TIMES NECESSARY TO SECURE EACH GUARD POST AT LEAST ONE WEEK IN ADVANCE. THE CONTRACTOR SHALL PAY ALL BILLS RELATIVE TO THE SECURITY SERVICES IN A TIMELY MANNER. FAILURE TO DO SO SHALL CAUSE PAYMENT TO BE WITHHELD FROM THE CONTRACTOR'S PERIODIC PAYMENT.

AT EACH GUARD POST, THE CONTRACTOR SHALL PROVIDE A BOOTH THAT IS HEATED, AIR CONDITIONED, ELECTRICALLY LIGHTED, AND PROVIDES SANITARY FACILITIES, AND AN ELECTRICALLY OPERATED GATE ARM. THE CONTRACTOR SHALL ALSO FURNISH AND MAINTAIN A PHONE IN ADDITION TO THE PORTABLE RADIO THAT OPERATES ON THE CITY'S OPERATIONAL FREQUENCY FOR THE GUARD POST. THE SECURITY GUARD SHALL MONITOR BOTH THE PHONE AND THE RADIO AND USE THEM TO INFORM THE APPROPRIATE AUTHORITIES IN THE EVENT OF A SECURITY VIOLATION.

THE CONTRACTOR SHALL OBTAIN PERMITS FOR THE VEHICLES HE ANTICIPATES UTILIZING IN THE PERFORMANCE OF THE WORK. ANY UN-PERMITTED VEHICLES, ALL EQUIPMENT AND ANY BADGED PERSONNEL SHALL BE ESCORTED TO AND FROM THE PROJECT WORK SITES BY ONLY ESCORTS APPROVED BY THE CITY'S SECURITY MANAGER AND PROVIDED BY THE CONTRACTOR. EACH ESCORT VEHICLE IS ALLOWED TO ESCORT A MAXIMUM OF TWO VEHICLES. BEFORE THE CONTRACTOR'S ESCORT VEHICLES ARE ALLOWED ON THE AOA TO ESCORT UNPERMITTED VEHICLES, THE CONTRACTOR'S ESCORT PERSONNEL MUST BE CERTIFIED BY AIRSIDE OPERATIONS. AN AIRSIDE OPERATIONS TRAINING CLASS MUST BE ATTENDED BY THE CONTRACTOR'S ESCORT PERSONNEL TO OBTAIN THIS CERTIFICATION. VEHICLES MUST MEET OCIP REQUIREMENTS.

ALL CONTRACTOR PERSONNEL INCLUDING SUBCONTRACTORS ON THE PROJECT SHALL HAVE AND DISPLAY PROPERLY AN OCIP SAFETY BADGE ISSUED BY THE DOA. THIS BADGE DISPLAYING A PHOTO OF EMPLOYEE SHALL BE WORN AT ALL TIMES WHILE ON THE AIRPORT. TO OBTAIN THIS BADGE EACH EMPLOYEE SHALL ATTEND A TWO – HOUR SAFETY CLASS GIVEN AT 7:00 AM EACH MORNING AT THE AIRPORT.

6. WILDLIFE MANAGEMENT:

CONTRACTOR MUST CAREFULLY CONTROL AND CONTINUOUSLY REMOVE WASTE OR LOOSE MATERIALS THAT MIGHT ATTRACT WILDLIFE. THE CONTRACTOR MUST BE AWARE OF AND AVOID CONSTRUCTION ACTIVITIES THAT CAN CREATE WILDLIFE HAZARDS ON THE AIRPORT. IN ADDITION, THE FEEDING OF WILDLIFE IS STRICTLY PROHIBITED. SUCH ACTIVITY SHALL BE NOTIFIED TO AIRSIDE OPERATIONS.

A. **TRASH** – ALL FOOD REMAINS AND TRASH SHALL BE COLLECTED AND STORED IN A SUITABLE CONTAINER EACH DAY. THE CONTAINER SHALL HAVE A STURDY LID AND REMAIN SECURELY CLOSED AT ALL TIMES.

B. **STANDING WATER** – STANDING WATER SHALL NOT BE PERMITTED. CONTRACTOR SHALL MANAGE OPERATIONS TO MINIMIZE STANDING WATER.

C. **TALL GRASS AND SEEDS** – CONTRACTOR SHALL NOT ALLOW GRASS OR WEEDS TO GROW HIGHER THAN 6" WITHIN THE WORK SITE. A MONOCULTURAL STAND OF GRASS MUST BE ESTABLISHED FOR ALL DISTURBED AREAS THAT ARE BEING RETURNED TO TURF THROUGHOUT THE AIRFIELD. CONTRACTOR SHALL ESTABLISH MOWING SCHEDULES TO MAINTAIN NEW GRASS UNTIL THE GRASS IS ACCEPTED AND TURNED OVER TO THE OPERATOR. IN ADDITION, MILLET GRASS SEED WILL NOT BE PERMITTED IN SEEDING OPERATIONS SINCE IT'S A BIRD ATTRACTANT. CONTRACTOR SHALL REFER TO SPECIFICATION T-901 IN THE CONTRACT FOR SEEDING REQUIREMENTS.

D. **FENCING AND GATES** – CONSTRUCTION SITE IS INSIDE THE AIRPORT SECURITY CHAIN LINK FENCE. ANY DAMAGE TO THE SIDA FENCE SHALL BE PROMPTLY REPAIRED, AND DOA SECURITY SHALL BE NOTIFIED.

E. **DISTRIBUTION OF EXISTING WILDLIFE HABITAT** – NO ENDANGERED OR THREATENED WILDLIFE SPECIES ARE KNOWN TO INHABIT THE CONSTRUCTION SITE. HOWEVER, THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION INSPECTOR SHOULD ANIMAL ACTIVITY BE OBSERVED IN THE



CITY OF ATLANTA, GEORGIA



Hartsfield-Jackson
Atlanta International Airport

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015


CONSTRUCTION SAFETY AND
PHASING PLAN 1

ISSUED FOR BID


WBS NUMBER: D.02.20.043	DRAWN BY: JDR
FC NUMBER: FC-7757	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: NO SCALE
	SHEET NO:

G.3.2

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
SP-1-1	MOBILIZATION	L.S.	1
SP-2-1	PROJECT CONTINGENCY	ALLOW.	1
SP-3-1	SUSPENSION TIME	PERIOD	1
SP-3-2	STAND-BY TIME	MINUTE	500
SP-3-3	DOWN TIME	PERIOD	2
SP-4-1	TRAFFIC CONTROL	L.S.	1
SP-5-1	UTILITY COORDINATION AND SCHEDULING	L.S.	1
SP-9-1	AS-BUILTS	L.S.	1
SP-10-1	AIRCRAFT MOVEMENT AREA ESCORTING	L.S.	1
SP-12-1	TAXIWAY LIMA VOID AND PIPE REPAIR	ALLOW.	1
SP-12-2	TAXILANE DIXIE VOID AND PIPE REPAIR	ALLOW.	1
SP-12-3	TAXIWAY SG SLOPE PAVING VOID REPAIR	ALLOW.	1
SP-13-1	STAGING AREA PREPARATION	L.S.	1
SP-14-1	RAPID RESPONSE REPAIR	ALLOW.	1
P-150-1	REMOVAL OF PAVEMENTS	S.Y.	5,900
P-150-2	REMOVAL OF EXISTING SIGN FOUNDATION	EA.	1
P-150-3	REMOVAL OF EXISTING SLOPE PAVING	S.Y.	500
P-152-1	PREPARATION OF SUBGRADE	S.Y.	4,400
P-152-2	SELECTIVE GRADING	S.Y.	8,000
P-152-3	BACKFILL	C.Y.	825
P-209-1	CRUSHED AGGREGATE BASE COURSE	C.Y.	1,005
P-401-1	BITUMINOUS SURFACE COURSE	TON	150
P-432-1	MILL ASPHALTIC CONCRETE - MICROMILL, 1/8" DEPTH	S.Y.	26,500
P-501-1	LOW SLUMP, LOW STRENGTH FILL CONCRETE	C.Y.	420
P-504-1	HIGH EARLY STR. CEMENT NON-REINF. CONC. PVT, 20" THICK	S.Y.	1,470
P-504-2	HIGH EARLY STR. CEMENT REINFORCED CONC. PVT, 20" THICK	S.Y.	330
P-504-3	HIGH EARLY STR. CEMENT NON-REINF. CONC. PVT, 10" THICK	S.Y.	2,500
P-504-4	HIGH EARLY STR. CEMENT REINFORCED CONC. PVT, 10" THICK	S.Y.	1,050
P-504-5	HIGH EARLY STR. CEMENT NON-REINF. CONC. PVT, 22" THICK	S.Y.	350
P-505-1	CONCRETE PAVEMENT SPALL REPAIR	S.F.	4,000
P-505-2	RETROFIT CONDUIT TRENCH REPAIR	S.F.	1,200
P-602-1	BITUMINOUS PRIME COAT	GAL.	330
P-605-1	COLD APPLIED SEALANT, CONTRACTION, CONSTR., AND LONG. JOINTS	L.F.	13,285
P-605-2	COLD APPLIED SEALANT, EXPANSION JOINTS	L.F.	600
P-605-3	CRACK SEALING	L.F.	1,750
P-605-4	SAW CUTTING FOR SEALING	L.F.	15,635
P-605-5	COLD APPLIED SEALANT, ASPHALT-CONCRETE JOINT INTERFACE	L.F.	190
P-615-1	CONCRETE SLOPE PAVING	S.Y.	500
P-621-1	PAVEMENT STRIPING AND MARKING	S.F.	7,410
P-621-2	PAVEMENT STRIPING AND MARKING REMOVAL	S.F.	6,420
P-621-3	TEMP. PAVEMENT MARKINING AND MARKING REMOVAL	S.F.	7,850
P-629-1	COAL TAR SEALER/REJUVENATOR	GAL.	2,700
P-630-1	THERMOPLASTIC COAL TAR EMULSION SEALCOAT	GAL.	3,300
D-705-1	8" PERFORATED PVC PIPE	L.F.	200
D-705-2	6" PERFORATED PVC PIPE	L.F.	1,690
D-705-3	COARSE AGGREGATE BACKFILL, #89 STONE	C.Y.	107
D-705-4	UNDERDRAIN CLEANOUT	EA.	10
D-705-5	8" NONPERFORATED UNDERDRAIN OUTLET PIPE, CONCRETE ENCASED	L.F.	35
D-751-1	REPAIR EXISTING TRENCH DRAIN, SINGLE SIDE	L.F.	180
D-751-2	REPAIR EXISTING TRENCH DRAIN, TWO SIDES	L.F.	70
D-751-3	MISCELLANEOUS CONCRETE	C.Y.	9
D-751-4	ADJUST STRUCTURE TO GRADE	EA.	6
D-751-5	SIGN FOUNDATION	EA.	1
F-162-1	8' BLK. PVC C.L. FENCE W/ EXT. ARMS & 3 STRDS BRB WIRE CORED	L.F.	160
F-162-2	REMOVAL OF CHAIN LINK FENCE	L.F.	160
F-162-3	14' WIDE, 8' TALL SINGLE LEAF SWING GATE	EA.	1
F-162-4	8' BLK. PVC C.L. FENCE W/ EXT. ARMS & 3 STRDS BRB	L.F.	170
T-901-1	SEEDING	S.Y.	6,900
T-901-2	TEMPORARY SEEDING	S.Y.	6,900
T-901-3	WATERING FOR GRASSING	HR.	60
T-904-1	SODDING	S.Y.	1,100
T-908-1	ASPHALT SPRAY MULCHING	S.Y.	6,900
L-108-1	SGL. COND. CABLE IN DUCT, #8 AWG FAA L-824, TP C, 5000V	L.F.	800
L-108-2	CONNECTOR KIT, #8 AWG, 5000V, FAA L-823	EA.	20
L-108-3	BARE COPPER CABLE, #6 AWG, CNT. INCL GRND RODS AND EX. WELDS	L.F.	400
L-108-4	5/8" X 10' COPPER CLAD STEEL GROUND ROD, FOR LIGHT BASE GRND	EA.	11
L-108-5	CABLE TAG	EA.	30
L-110-1	CONC. ENC., 2" SCH 80 PVC COND. INSTALLED IN CONC. PAVEMENT	L.F.	250
L-120-1	L-852D BIDIRECT., TW CL LT, NAR BM, LED, G/G, 12" DIA., 24" DPTH	EA.	4
L-120-2	12" DIA., 24" DEEP BASE CAN, INSTALLED IN NEW PCC	EA.	5
L-120-3	12" DIA., 24" DEEP BASE CAN WITH 3/4" BLANK COVER, IN NEW PCC	EA.	6
L-120-4	L-852D BIDIRECT., TW CL LT, WIDE BM, LED, G/G, 12" DIA., 24" DPTH	EA.	1
L-124-1	REMOVAL OF EXISTING CABLE	L.F.	800
L-124-2	REMOVAL OF EXISTING FIXTURES	EA	5



CITY OF ATLANTA, GEORGIA



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1	10/30/14	JDR	ADDENDUM 1
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SUMMARY OF QUANTITIES

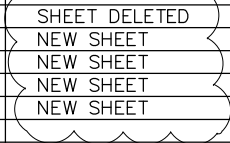
ISSUED FOR BID

WBS NUMBER: D.02.20.043	DRAWN BY: JDR
FC NUMBER: FC-7757	DESIGNED BY: JDR
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: N.T.S.
	SHEET NO: G.2.1

AIRFIELD REPAIR 2015

NOT RELEASED FOR CONSTRUCTION

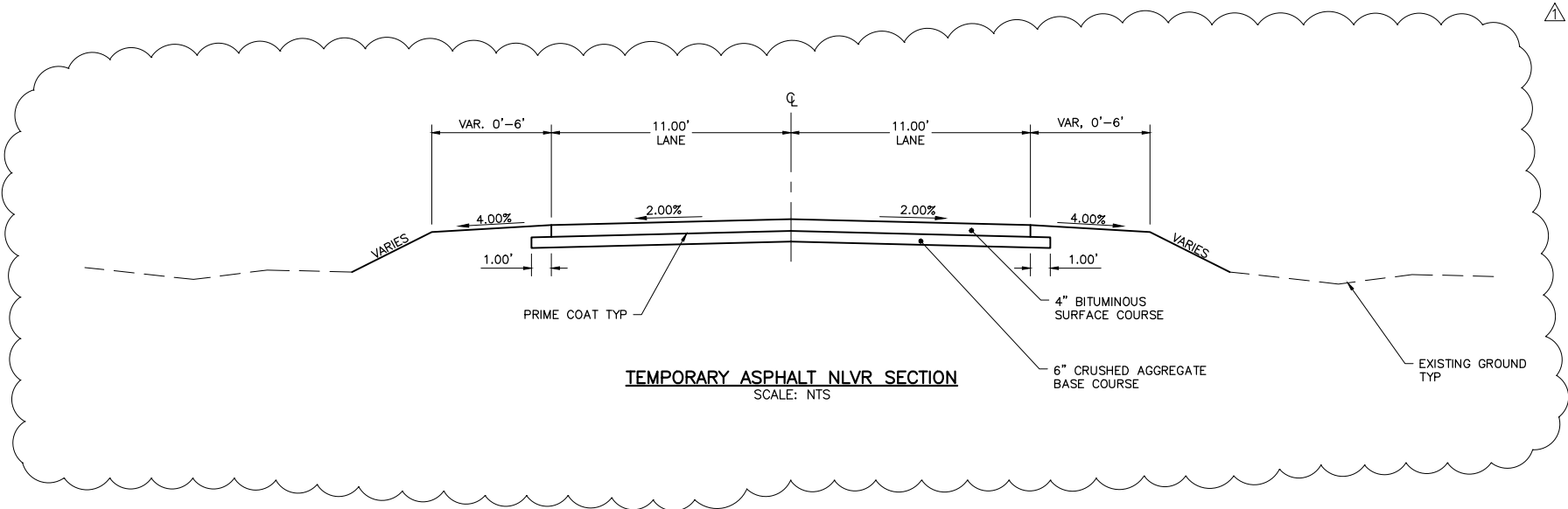
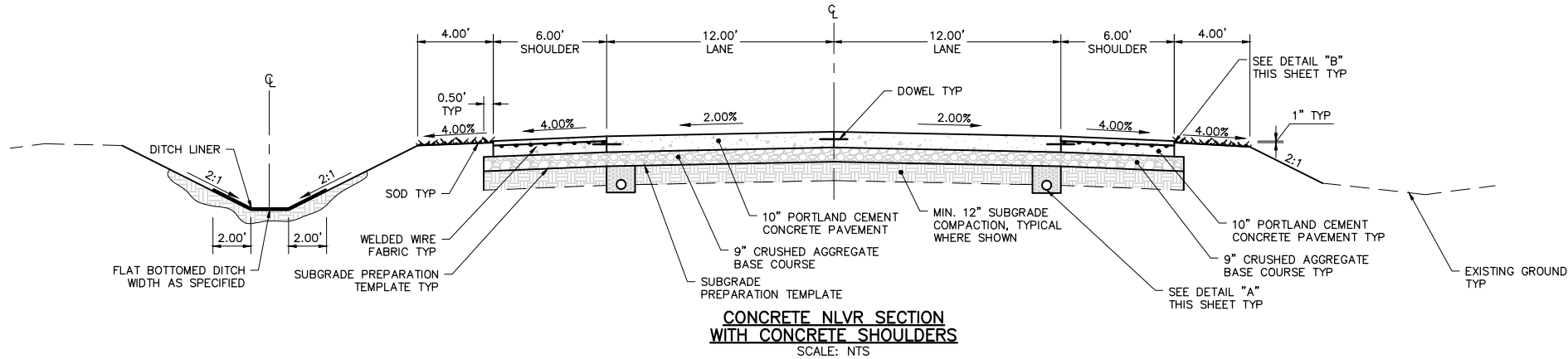
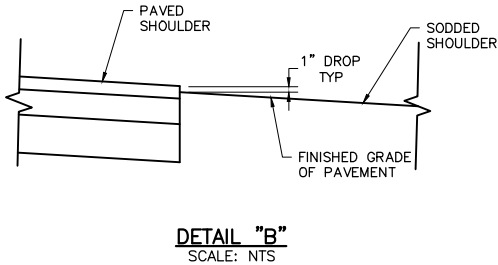
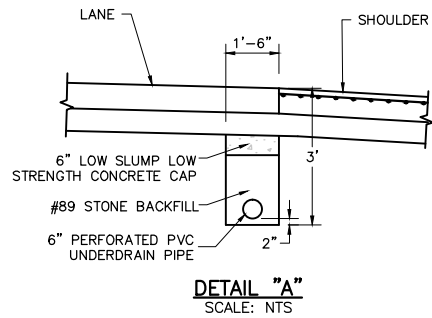
DRAWING RELEASE STATUS SUMMARY									
SHT. NO.	DRAWING NUMBER	SHEET TITLE	DATE OF LATEST RELEASE					COMMENTS	
		GENERAL	ISSUED FOR BID	ADDENDUM 1					
1	G.0.1	COVER SHEET	10/6/14						
2	G.1.1	DRAWING INDEX & RELEASE STATUS SUMMARY	10/6/14	10/30/14					
3	G.2.1	SUMMARY OF QUANTITIES	10/6/14	10/30/14					
4	G.3.1	CONSTRUCTION CONTROL PLAN	10/6/14						
5	G.3.2	CONSTRUCTION SAFETY AND PHASING PLAN 1	10/6/14	10/30/14					
6	G.3.3	CONSTRUCTION SAFETY AND PHASING PLAN 2	10/6/14						
7	G.4.1	CLOSURE PLAN	10/6/14						
8	G.4.2	CLOSURE PLAN DETAILS	10/6/14						
9	G.4.3	TAXIWAY LIMA VOID AND PIPE REPAIR PHASING PLAN	10/6/14	10/30/14					
10	G.4.4	TAXILANE DIXIE VOID AND PIPE REPAIR PHASING PLAN	10/6/14	10/30/14					
11	G.4.5	NLVR PAVEMENT RECONSTRUCTION – CONCOURSE D SOUTH PHASING PLAN	10/6/14	10/30/14					
	G.4.6	NLVR PAVEMENT RECONSTRUCTION – TW A13 TO F.S. 24 PHASING PLAN	10/6/14	10/30/14					
12	G.4.6.1	NLVR PAVEMENT RECONSTRUCTION – TW A13 TO F.S. 24 PHASE 1 DETOUR PLAN		10/30/14					
13	G.4.6.2	NLVR PAVEMENT RECONSTRUCTION – PHASE 1 DETOUR SIGNAGE PLAN		10/30/14					
14	G.4.6.3	NLVR PAVEMENT RECONSTRUCTION – TW A13 TO F.S. 24 PHASE 2 DETOUR PLAN		10/30/14					
15	G.4.6.4	NLVR PAVEMENT RECONSTRUCTION – PHASE 2 DETOUR SIGNAGE PLAN		10/30/14					
16	G.4.7	TAXIWAY JULIETT PAVEMENT REPLACEMENT – PHASING PLAN	10/6/14	10/30/14					
		CIVIL/ELECTRICAL							
17	C.1.1	ASPHALT SHOULDER REJUVENATOR APPLICATION PLAN 1	10/6/14						
18	C.1.2	ASPHALT SHOULDER REJUVENATOR APPLICATION PLAN 2	10/6/14						
19	C.1.3	THERMOPLASTIC COAL TAR EMULSION SEALCOAT APPLICATION PLAN 1	10/6/14	10/30/14					
20	C.1.4	THERMOPLASTIC COAL TAR EMULSION SEALCOAT APPLICATION PLAN 2	10/6/14						
21	C.1.5	VOID AND PIPE REPAIR – DEMOLITION PLAN	10/6/14						
22	C.1.6	VOID AND PIPE REPAIR – RECONSTRUCTION PLAN	10/6/14						
23	C.1.7	TAXIWAY SG BRIDGE VISUAL ENHANCEMENTS	10/6/14						
24	C.1.8	TAXIWAY SG SLOPE PAVING REPAIR 1	10/6/14	10/30/14					
25	C.1.9	NLVR PAVEMENT RECONSTRUCTION – CONCOURSE D SOUTH DEMOLITION PLAN	10/6/14						
26	C.1.10	NLVR PAVEMENT RECONSTRUCTION – CONCOURSE D SOUTH JOINT LAYOUT PLAN	10/6/14						
27	C.1.11	NLVR PAVEMENT RECONSTRUCTION – TAXIWAY A13 TO FIRE STATION 24 DEMOLITION PLAN	10/6/14						
28	C.1.12	NLVR PAVEMENT RECONSTRUCTION – TAXIWAY A13 TO FIRE STATION 24 GRADING AND DRAINAGE PLAN	10/6/14						
29	C.1.12.1	NLVR PAVEMENT RECONSTRUCTION – TAXIWAY A13 TO FIRE STATION 24 UNDERDRAIN PLAN	10/6/14	10/30/14					
30	C.1.13	NLVR PAVEMENT RECONSTRUCTION – TAXIWAY A13 TO FIRE STATION 24 JOINT LAYOUT PLAN	10/6/14						
31	C.1.14	NLVR PAVEMENT RECONSTRUCTION – TAXIWAY A13 TO FIRE STATION 24 SIGNING AND MARKING	10/6/14	10/30/14					
32	C.2.1	NLVR TYPICAL SECTIONS	10/6/14						
33	C.2.2	NLVR JOINT DETAILS	10/6/14						
34	C.7.1	FULL DEPTH SLAB DEMOLITION PLAN	10/6/14						
35	C.7.2	FULL DEPTH SLAB REPLACEMENT PLAN	10/6/14						
36	C.7.3	FULL DEPTH SLAB REPLACEMENT DETAILS	10/6/14						
37	C.7.4	TRENCH DRAIN REPAIR PLANS – SOUTH CARGO RAMP	10/6/14						
38	C.7.5	TRENCH DRAIN REPAIR PLANS – RAMP 6 SOUTH	10/6/14						
39	C.7.6	TRENCH DRAIN REPAIR PLANS – RAMP 6 NORTH	10/6/14						
40	C.7.7	TRENCH DRAIN REPAIR DETAILS	10/6/14						
41	C.7.8	SPALL AND JOINT REPAIR DETAILS	10/6/14						
42	C.7.9	TYPICAL SPALL REPAIR REBAR PLACEMENT DETAILS	10/6/14						
43	C.7.10	RETROFIT CONDUIT TRENCH REPAIR DETAILS	10/6/14						
44	C.9.1	MARKING DETAILS	10/6/14						
45	C.14.1								



NEW SHEET <

G.1.1

c:\cities\Engineering\J Rone\Airfield Pavement Repair 2015\DWG\Sheets\03-Addendum 1\C2.1 NLVR Typical Sections.dwg, 10/29/2014 5:19:48 PM



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015

NLVR TYPICAL SECTIONS

ISSUED FOR BID

WBS NUMBER:
D.02.20.043

FC NUMBER:
FC-7757

CONSULTANT PROJECT NUMBER:

DRAWN BY:
JDR

DESIGNED BY:
JDR

CHECKED BY:
RFM

APPROVED BY:
RFM

DATE:
10/6/14

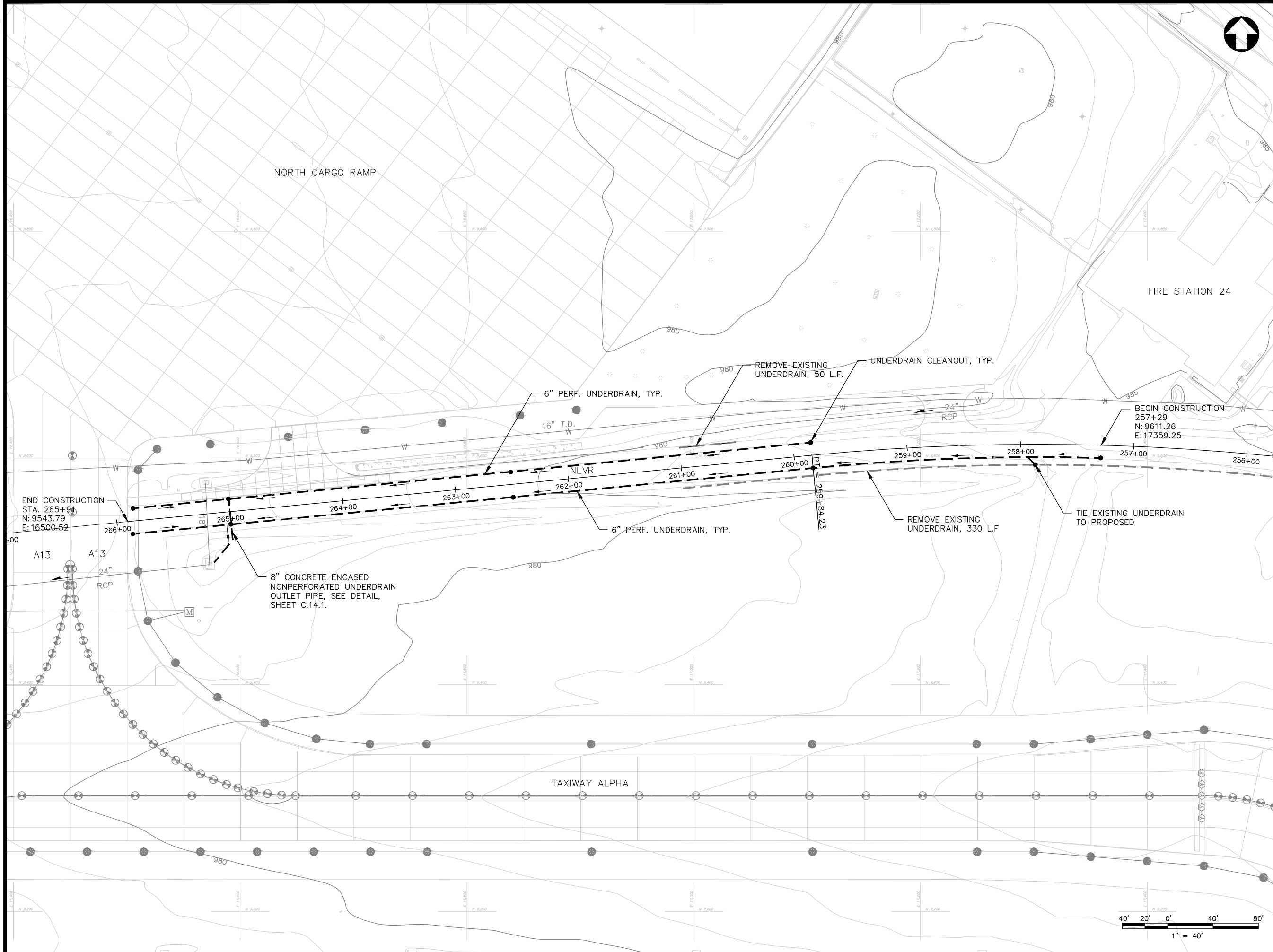
SCALE:
N.T.S.

SHEET NO:

C.2.1

AIRFIELD REPAIR 2015

NOT RELEASED FOR CONSTRUCTION



CITY OF ATLANTA, GEORGIA



Hartsfield-Jackson
Atlanta International Airport

NOTES:

1. AIRFIELD LIGHTING FIXTURES SHALL BE PROTECTED AT ALL TIMES.
2. MARKINGS TO REMAIN SHALL BE PROTECTED OR RESTORED.
3. SEE NOTE 9, SHEET G.4.2.

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015
NLVR PAVEMENT
RECONSTRUCTION
TAXIWAY A13 TO FS 24
UNDERDRAIN PLAN

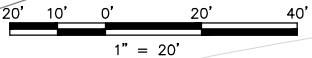
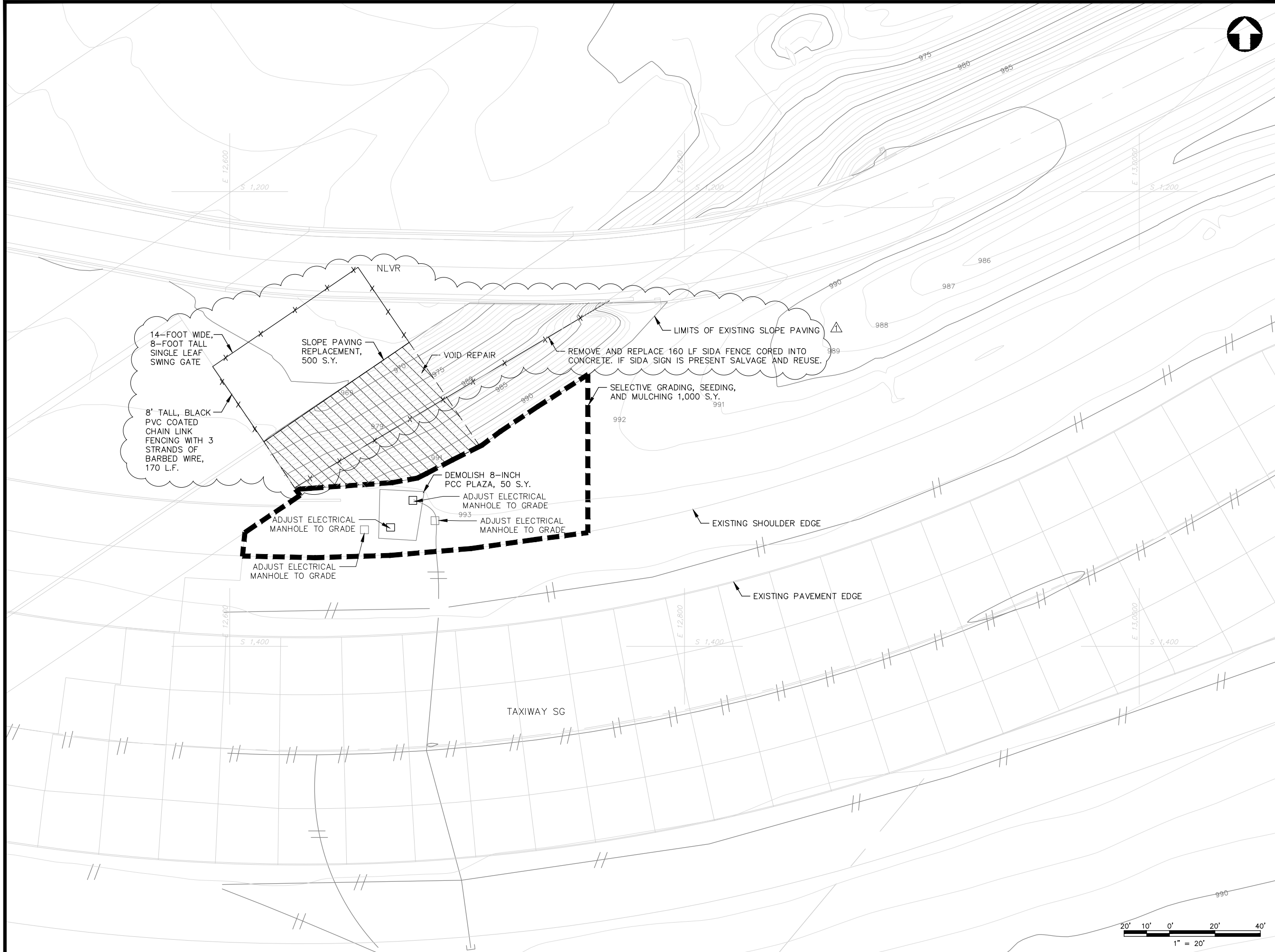
ISSUED FOR BID

WBS NUMBER: D.02.20.043	DRAWN BY: JDR/OJW
FC NUMBER: FC-7757	DESIGNED BY: JDR/OJW
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM
	APPROVED BY: RFM
	DATE: 10/6/14
	SCALE: 1"=40'
	SHEET NO:

C.1.12.1

NOT RELEASED FOR CONSTRUCTION

AIRFIELD REPAIR 2015



CITY OF ATLANTA, GEORGIA



Hartsfield-Jackson
Atlanta International Airport

NOTES:

1. CLOSURES OF RUNWAY 10-28 AND TAXIWAY SG MAY BE REQUIRED TO PERFORM THIS WORK.
2. AIRFIELD LIGHTING FIXTURES SHALL BE PROTECTED AT ALL TIMES.
3. AIRFIELD MARKINGS TO REMAIN SHALL BE PROTECTED OR RESTORED.

1	10/30/14	JDR	ADDENDUM 1
NO.	DATE	BY	REVISION

AIRFIELD REPAIR 2015

TAXIWAY SG SLOPE
PAVING REPAIR 1

ISSUED FOR BID

WBS NUMBER: D.02.20.043	DRAWN BY: JDR/OJW
FC NUMBER: FC-7757	DESIGNED BY: JDR/OJW
CONSULTANT PROJECT NUMBER:	CHECKED BY: RFM

APPROVED BY:
RFM

DATE:
10/6/14

SCALE:
1"=20'

SHEET NO:

C.1.8